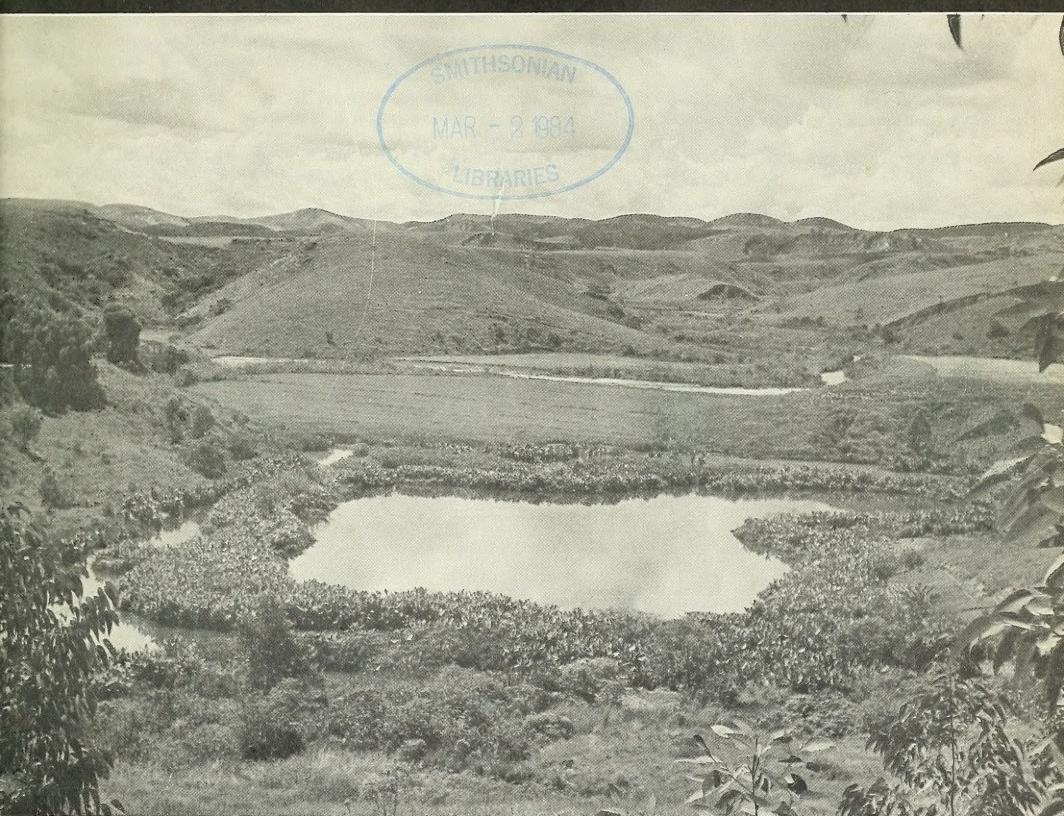






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COMMERCIAL FISHERIES REVIEW



VOL. 24, NO. 9

SEPTEMBER 1962

FISH and WILDLIFE SERVICE
United States Department of the Interior
Washington, D.C.



COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor

Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

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Use of funds for printing this publication has been approved by the Director of the Bureau of the Budget, May 10, 1960.

5/31/63

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COMMERCIAL FISHERIES REVIEW

September 1962

Washington 25, D. C.

Vol. 24, No. 9

THE BLUE CRAB AND ITS FISHERY IN CHESAPEAKE BAY^{1/}

Part 2 - Types of Gear for Hard Crab Fishing^{2/}

By W. A. Van Engel*

ABSTRACT

During the 90-year history of the Chesapeake Bay blue crab fishery, many types of fishing devices were tried, but only pots, trotlines, and dredges proved suitable, and they emerged as the primary types of gear for catching hard crabs. In the early years of the fishery, trotlines with their various modifications were used principally for catching hard crabs in the summer. The Chesapeake Bay crab pot, patented in 1938 and modified only slightly since, gradually replaced the trotline. Pots now account for two-thirds of the Virginia hard crab catch and more than half of the Maryland catch. The dredge, first used about 1900 and relatively unchanged with time, is still the primary winter gear.

INTRODUCTION

The gradual increase in importance of the 90-year-old blue crab industry to the economy of the Chesapeake Bay region has been due chiefly to development of the hard crab fishery. It now ranks second or third among Virginia and Maryland's fisheries, exceeded in quantity only by menhaden and in value by oysters and occasionally by menhaden. On the national scale, the magnitude of the industry is equally impressive, for the total Chesapeake Bay hard crab catch is about equal to the total blue crab catch of all the other Atlantic and Gulf Coast states.

Prior to 1900 the Chesapeake Bay blue crab industry developed slowly and fishing for crabs remained a casual occupation. Although there has been a coast-wide consumer interest in the blue crab since colonial times, especially in the soft-shell crab, limited transportation and refrigeration facilities hindered the early expansion of the industry. The first out-of-state shipment of Chesapeake Bay soft crabs left Crisfield, Md., for Philadelphia by train in 1873. In 1878, a large summer trotline fishery was started near Hampton, Va., to supply hard crabs to James McMenamin and Company, the first to produce cooked crab meat in hermetically-sealed cans. Fresh-cooked crab meat in iced, unsealed cans was not made available until 1883. During those early years and un-

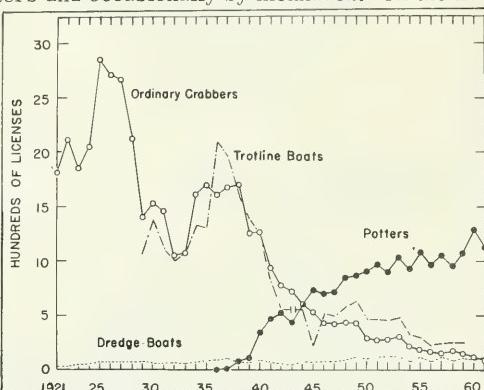


Fig. 1 - Virginia hard crab licenses, 1921-1961. Numbers of ordinary crabbers, potters and dredge boats are from unpublished license records of the Virginia Commission of Fisheries. Combined hand-dip and patent-dip trotline boats are from records of U. S. Bureau of Fisheries and U. S. Fish and Wildlife Service; no data available for 1943. Over 90 percent of the "ordinary crabbers" licenses are for hand-dip trotlines.

^{1/}Contributions from the Virginia Institute of Marine Science, No. 121.

^{2/}Soft and peeler crab fishing gears will be described in a later publication.

* Senior Marine Scientist, Virginia Institute of Marine Science, Gloucester Point.

til 1900, average annual landings in Virginia and Maryland were less than 10 million pounds and were valued at less than \$350,000. Sixty percent of the weight but only one-fourth of the value was derived from hard crabs. The remainder was attributed to soft and peeler crabs^{3/} (Rathburn 1887, Roberts 1905, Churchill 1919, U. S. Bureau of Fisheries 1922).

In contrast, landings during a recent 15-year period, 1946-1960, averaged about 60 million pounds and valued at more than \$3.5 million. Over 90 percent of the catch and about 80 percent of the value was derived from hard crabs (U. S. Fish and Wildlife Service 1942-1961, 1961).

From 1929 to 1932^{4/} more than 85 percent of the total Atlantic and Gulf Coast catch of blue crabs came from Chesapeake Bay. Average Chesapeake landings were about 60 percent from 1933 to 1953, and since 1953 have been about 47 percent of the total (U. S. Bureau of Fisheries 1922-1941; U. S. Fish and Wildlife Service 1942-1961, 1961).

Almost the entire hard crab catch of the Bay is now marketed as fresh-cooked crab meat in iced, unsealed cans. In 1959, 7.5 million pounds of meat was produced, half from Virginia and half from Maryland. The extent of distribution has been somewhat limited by extreme fluctuations in the basic supply, the perishableness of the product, and the relatively high costs of production, transportation, and promotion (Quittmeyer 1950, 1957; Van Engel 1954, 1958). Some of the meat is processed as frozen deviled crabs and crab cakes, and canned crab soups. A relatively small number of large, selected male crabs, called "jimmies" or "channelers," are shipped alive direct to large cities to be served at seafood bars as steamed hard crabs.

At the base of the production pyramid is a force of about 1,800 watermen in Virginia and 3,300 in Maryland. Since their catch is limited by the basic supply and by restrictions imposed by legislation and market conditions, only by selecting the most efficient types of gear can the watermen maintain a reasonable income. While many types of gear have been used to catch crabs in the Chesapeake Bay in the last 90 years, only a few have proved economically practical.

The bulk of the hard crab catch has been made by a few types of widely different design: crab pots and trotlines in summer and dredges in winter. Less than one-fiftieth has come from dip nets, crab pounds, hand scrapes, haul seines, and hand lines, and incidental catches by fish pounds, gill nets, otter trawls, oyster tongs, and oyster dredges. Modifications have made existing gear more efficient, resulting in more effective fishing time per unit of gear. A review of the types of Maryland crab fishing gear is given by Cargo (1954).

Continuous records of the types of hard crab gear in Virginia are available since 1921 (fig. 1) and in Maryland since 1916 (fig. 2)--(Virginia Commission of Fisheries, unpublished license records; Maryland, Department of Conservation 1924-1941, Department of Tidewater Fisheries 1942, Board of Natural Resources 1941-1959). Reports of the U.S. Bureau of Fisheries (1922-1941) and the U.S. Fish and Wildlife Service (1942-1961) show similar trends in types of gear, but continuous records are not available for years prior to 1929.

TRENDS IN GEAR

The hand-dip trotline was favored for many years as a summer gear. The exact number used will probably never be known. Until 1937 hand-dip trotlines were exempted from tax-

^{3/}Soft and peeler crab fishing gears will be described in a later publication.

^{4/}Comparative data are not available for earlier years.

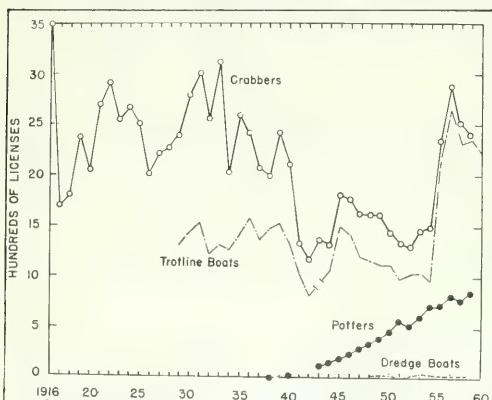


Fig. 2 - Maryland hard crab licenses, 1916-1960. Numbers of crabbers, potters and dredge boats are from the Maryland Conservation Department, Department of Tidewater Fisheries and Board of Natural Resources. Hand-dip trotline boats are from records of U. S. Bureau of Fisheries and U. S. Fish and Wildlife Service; no data available for 1943. Hand-dip trotline licenses account for about one-half the "crabbers" licenses prior to 1938.

tion in Virginia or included in a general "ordinary crabbers" license along with dip nets and peeler-crab scrapes (fig. 1). Since 1937 peeler-crab scrapes have been separately licensed, and trotline licenses have numbered probably more than 95 percent of the "ordinary" licenses. Patent-dip trotlines, introduced about 1920, have never been widely used and have accounted for a relatively small percentage of the catch. Combined estimates of hand-dip and patent-dip trotline boats (U. S. Bureau of Fisheries 1922-1941; U. S. Fish and Wildlife Service 1942-1961) are in good agreement with the numbers of "ordinary crabbers" licenses in Virginia since 1929 (fig. 1). It is probable that before 1929 over 90 percent of the "ordinary" licenses were hand-dip trotlines.

During the economic depression of the early 1930's, many Virginia watermen replaced their trotlines with dip nets, for which no license and little expense were required, and caught peeler crabs instead of hard crabs. A few years later, during a temporary return to trotlines, the Chesapeake Bay crab pot was introduced. The high efficiency of the pot has encouraged many watermen to abandon trotlines for them. Dredges have been the only gear used in Virginia in the winter fishery since its inception about 1900.

Similar trends have occurred in Maryland although the exact numbers of gear types used have not been reported. Since 1916 a general "crabbers license" has permitted the use of a trotline, peeler-crab scrape, dip net, push net, crab haul seine, or crab pound net (fig. 2). Between 1929 and 1938 approximately one-half of the "crabbers" licenses were for the use of hand-dip trotlines (U.S. Bureau of Fisheries 1922-1941); this relationship probably existed prior to 1929. The decline in number since 1938 is the result of the gradual replacement of trotlines with pots. The precipitous rise in 1955 and 1956 resulted from a new law requiring licenses for all trotlines over 100 yards in length. This was enacted to tax increased numbers of casual crabbers, and the figures are probably indicative of previously existing but unreported effort. Patent-dip trotlines have never been used in Maryland. Dredges were first permitted in Maryland in 1947 and are used only in the bays on the ocean side of the eastern shore.

CRAB POT

The first crab pot used in Chesapeake Bay was a small, baited poultry-wire trap, 36 x 30 x 12 inches, patented in 1928 by B. F. Lewis of Harryhogan, Va. (Virginia Commission of Fisheries, unpublished minutes; Wharton 1956). Lewis' early model pot was not widely used because it allowed too many crabs to escape. His modified gear, which was introduced in 1936 and patented in 1938 (fig. 3), is essentially the design used today. The principal feature of this patent is the separation of the main body of the pot into two chambers, a lower bait chamber which contains a bait holder and passageways from the outside, and a trap chamber lying over the bait chamber. Hard crabs enter the bait chamber through entrance funnels located at the lower edges of the pot and then rise to pass into the trap chamber through a slit in the partition. Crabs are removed by spreading an opening in one seam at the top and shaking the crabs from the pot. The seam is closed by lapping over the adjacent edges and locking them in place with a wire hook.

Usually pots are cubical in shape, 2 feet on each side, and made of 1 to 1½-inch hexagonal mesh, 18 gauge poultry wire, galvanized

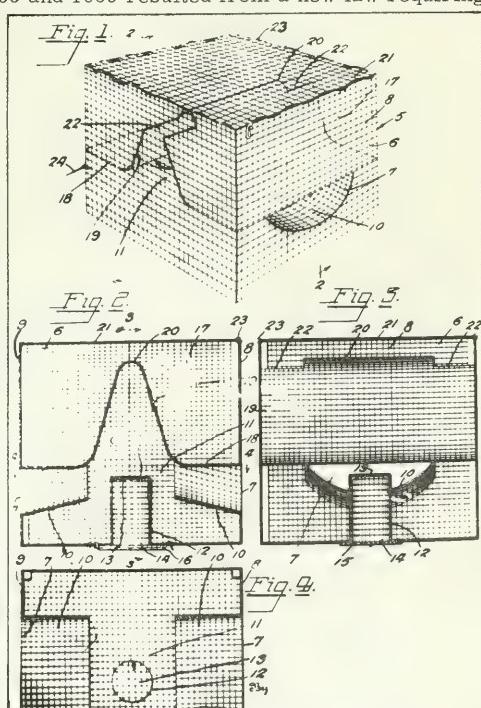


Fig. 3 - Drawings accompanying B. F. Lewis' crab pot (trap) patent, filed September 2, 1937. Fig. 1, External view; Fig. 2, Vertical section through entrance funnels, bait box and partition; Fig. 3, Vertical section, at right angle to Fig. 2, through bait box and partition; Fig. 4, Part of horizontal section top of funnels.

after weaving (fig. 4). Bait cups are made of 1-inch mesh wire or double thickness of $1\frac{1}{2}$ -inch wire. Nine pots can be cut from a roll of wire 150 feet long and 2 feet wide.

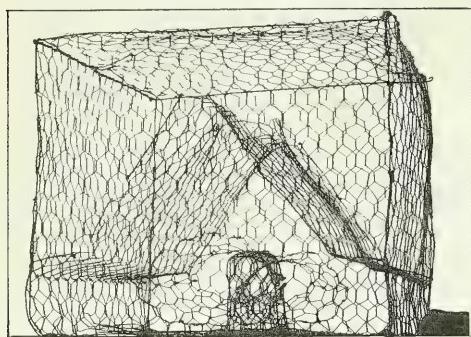


Fig. 4 - Chesapeake Bay crab pot is 24 x 24 x 20 inches, made of double-galvanized, 18-gauge, hexagonal-mesh wire.

James rivers, where there are strong bottom currents, pots are made only 20 inches high.

Pots are set along the flat, sandy or muddy edges of a river or Bay channels in depths ranging from 6 to 60 feet in continuous or parallel series, the number depending on the success of fishing in the locality but usually 100 or more feet apart. In 1928 as many as 30 to 40 pots were tied on a trotline, each pot attached to the line by a 4-foot rope. The ends of the trotline were marked by buoys. Later to avoid frequent thefts of pots, buoys were removed and the crabber depended on visible landmarks and good grappling technique to recover his line. That method of setting pots was soon abandoned, and for more than 25 years pots have been set with individual lines and buoys. Sometimes along the edges of a channel approaching a harbor or dock, pots must be tied singly to stakes, otherwise they could be dragged or washed to shoal water by boat traffic.

Potters lift their pots daily except Sunday, working from small inboard or outboard motor boats up to 40 feet in length. Most of the men leave their docks in early morning darkness to reach the crabbing grounds at day-break and return about noon. Actual fishing time averages $2\frac{1}{2}$ hours per 100 pots.

For better control of his boat while fishing a set of pots, the potter runs against the tidal current. With an almost continuous motion he approaches a buoy, slows the forward speed of his boat by reducing throttle and shifting gears to reverse, snares the buoy line with a short-handled hook, shifts to neutral, pulls on the buoy line to raise the pot to the surface and into his boat (fig. 5), shifts to forward gear, increases throttle and steers toward the next pot. Then he begins to empty the pot and re-bait it with menhaden, salted fish heads, or any kind or part of oily trash fish. Just before he reaches the next pot the previous one is tossed overboard.

Only minor improvements have been made to the basic design of Lewis' patent since 1938. Details of a design popular in the late 1940's are given by Andrews (1947). Frames of iron rod were lashed to the sides to increase the rigidity of the pot, but have not been used since wire manufacturers began using heavy gauge wire in the selvage.

Since all pots are handmade, their construction can be varied to suit local conditions, individual preference and budget. Continued use of pots has demonstrated a need to increase their stability. All watermen stabilize their pots with a square frame of $\frac{1}{2}$ to $\frac{3}{4}$ -inch iron rod tied to the base, or galvanized pipe, bricks or cement inserted in the bottom corners. In Tagier Sound and in the York and

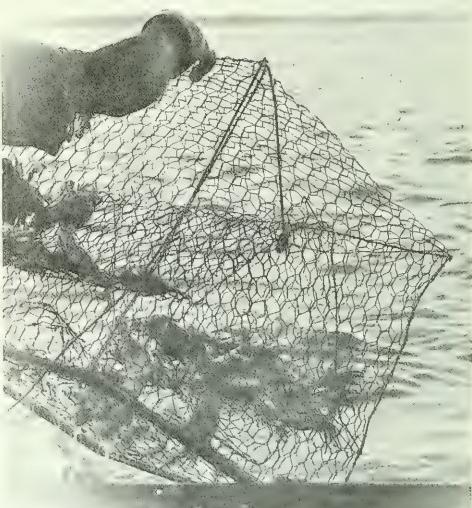


Fig. 5 - When stock size is large, catch may average 200 adult crabs per pot.

In early summer in some waters, algal growth may cover the mesh. Circulation of water through the pot is retarded, the pot is more easily tumbled by strong currents, and the escape of bait odors is restricted. For these as well as other reasons, the efficiency of the pot is effectively lowered. Sometimes pots are removed to land and dried for several days, but usually they are so fouled by the middle of June that they are discarded.

During the 8 months potting season, from April through November, the loss of pots from all sources is so great as to require one or more replacements for each pot initially set out. Large losses occur in storms, for strong bottom currents or turbulence may tumble a pot into deeper water or roll it a few yards until the buoy line becomes wrapped around it. In either event the buoy is pulled beneath the surface and out of sight of the fishermen. Sometimes pots may be recovered by dragging bars of ganged hooks.

Careful handling of pots is required to minimize cracking the protective zinc coating. Once the underlying iron core is exposed, corrosion is rapid. At best, pots withstand daily wear and corrosion about 16 weeks. Recent studies suggest that corrosive destruction may be prevented if a sacrificial anode of zinc is secured to the galvanized netting (Buck and Van Engel 1960). At the end of the crabbing season, usable pots are sometimes dipped in hot tar to prevent further corrosion until the next season.

The crab pot has become especially popular because it is highly efficient, simply constructed, easily handled, and requires relatively little time to gather the catch. An estimated 100,000 pots were used in 1960 in Virginia; about three-fourths that many in Maryland. The pot has almost completely replaced the hand-dip trotline in Virginia and now accounts for two-thirds of the annual catch of hard crabs.

B. F. Lewis' early model was called a "trap," a name also applied to the crab pound net. Separate names and license taxes for pots and traps were not applied until about 1938. The number of pot licenses has steadily increased in Virginia (fig. 1), and the number of pots allowed each man has changed. An unlimited number could be used before 1940, 35 per man until 1944, 50 per man until 1956, and an unlimited number since July 1956. Minimum mesh size was 1 inch until 1941. From 1941 to 1944, 1-inch mesh was allowed in Chesapeake and Mobjack bays, but $1\frac{1}{2}$ -inch mesh was required in all other waters. It has been $1\frac{1}{2}$ inches in all waters of the Commonwealth since 1944.

Similar events occurred in Maryland. The pot was introduced in 1939 and then outlawed from 1941 to 1943. It is now permitted in some waters of that state (Cronin 1950). The allowance per man was 35 from 1943 to 1948 and has been 50 since 1948. Minimum mesh size is 1 inch. It is one of the most important types of crab gear in Maryland, where landings by pots represent over 55 percent of the total annual catch.

TROTLINE

The hand-dip trotline is a baited, hookless line anchored on the bottom in moderate to deep water, and is used to catch hard crabs when they are actively feeding, primarily from April through November. Lengths of $\frac{1}{2}$ to $\frac{3}{16}$ -inch cotton, sisal, or hemp rope are spliced together to form lines 100 yards to 1 mile in length, depending on the locality of the set and the "crab-biting-rate." When large numbers of crabs are being caught, lines may be shorter so that the crabber may lift his set before all the bait is eaten. The longest lines are used wherever bottom currents are strong, to insure a constant, effective number of baits lying on the bottom. Untarred lines are usually used because they do not give off odors offensive to crabs.

Trotlines have been used continually since commercial crabbing began in the 1870's. Formerly they were rigged with grapnel-type anchors tied to each end, and with a buoy line attached 30 or more feet from each grapnel (fig. 6A). With this system of rigging, while the trotline was lifted to the surface by pulling in the buoy line, it was necessary that the boat remain stationary over the end of the set, to avoid dragging the anchor and thus changing the direction of the set or getting the line fouled in the propeller.

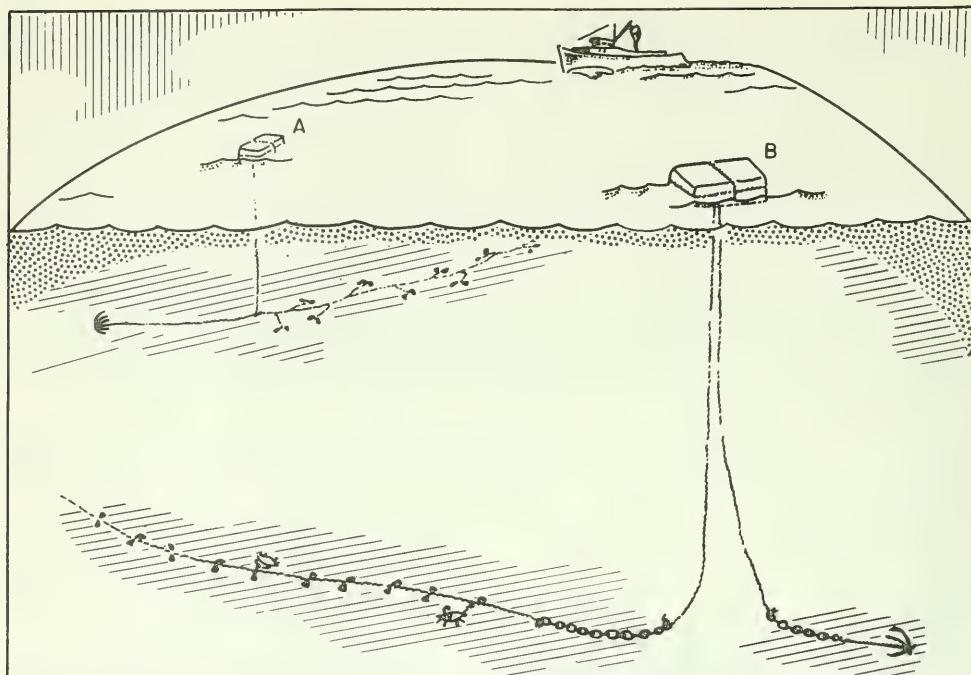


Fig. 6 - A. Former arrangement of buoys and line on hand-dip trotline. B. Present rigging of hand-dip trotline.

These problems are now avoided simply by dropping separate lines from the buoy to the grapnel and from the buoy to the trotline (fig. 6B; Andrews 1948). The ends of the buoy line and trotline are joined by a short length of heavy chain to keep the trotline on the bottom. This arrangement permits the crabber to approach the buoy, lift the trotline to the surface, place it over the spool, and begin fishing with the continuous forward motion of the boat.

Fresh beef tripe is preferred as bait, although salted tripe and eels, hog jowls and ears, and small, tough fish such as the hogchoker are sometimes used. About 200 pounds of tripe may be used each week during October and November on a 600-yard line. More bait is used in summer when crabs are more active. From 60 to 80 pounds of tripe are used on the first full baiting of the line.

When the trotline was first extensively used in 1878, bait was tied to the ends of 6- to 24-inch lateral lines, called snoods, spaced about 2 feet apart (fig. 6A). The size of the catch was partly dependent on how many times a crabber could run the same line in one day. In the earliest years of the fishery, the crabber pulled his boat forward by lifting and tugging, hand-over-hand, on the trotline. It was most convenient, but not comfortable for long periods of time, for him to lie prone on the bow of his boat while crabbing. A short-handled dip net was kept handy to scoop up crabs as they came to the surface clinging to the baited line. "Hand" trotlining was easiest "running" with the tide or with the wind.

Although most men used the "hand" trotline between 1900 and 1925, a few used sail, or motor power derived from either a 2-cycle or 4-cycle, 1- or 2-cylindered marine engine. Most engines were direct-drive, and a clutch was optional equipment. At first, motor power was used primarily for transporting groups of 10 or more "hand" trotline crabbers

to and from the crabbing grounds. Men who used their direct-drive engines in working a line were forced to work against the tide, or to obtain slower speeds by means of a drag. This required a two-man crew, one to watch the trotline and scoop up crabs, the other to run the engine.

To take advantage of the greater speed of a motor boat, the trotline was no longer lifted by hand, but allowed to pass over a roller or spool extending outboard from the side of the boat (fig. 7). This forced abandonment of lateral lines, for they easily became entangled on the spool. Thereafter bait was secured either in a slip-knot or simply tucked between strands of the main line.

In the late 1920's automobile engines were converted for boat use. Since then their low cost has more than offset their inefficiency compared with marine engines of the same horsepower, and they have become almost standard as the power supply of present day crab boats (Chapelle 1955).

Trotlines usually are set parallel to shore to be fished with the tide up- or downriver. If fished during slack tide, it may be set in any direction, usually perpendicular to shore. To fish his line, the crabber approaches the buoy, picks up the line with a short-handled hook and places it on the spool which projects about a foot from the side of the boat. As the boat moves along the line, baits are raised to the surface and crabs clinging to the bait are scooped up by a dip net. Crabs drop off as the line breaks the surface of the water and crabbers must be quick with the dip net. Since crabs cling to a cotton mesh bag, the most effective dip net has a wire mesh bag.

Trotlines usually are fished from daybreak to late morning, and sometimes, though infrequently, fished again in the cooler evening hours. At the end of a day's fishing, baits are checked and renewed if necessary, and the line coiled in a barrel and well-sprinkled with salt to protect bait and line against rotting.

The trotline has been extensively used in localities where many undersized crabs are present, as in the upper-Bay waters of Maryland, for it permits easy culling of the catch.

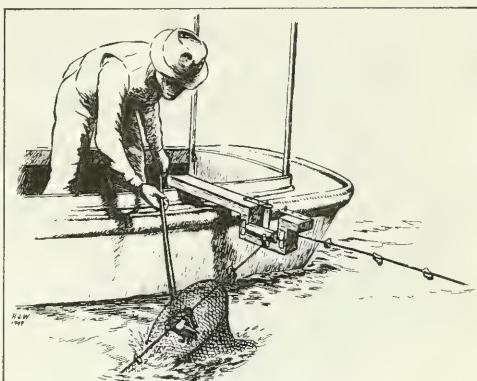


Fig. 7 - The hand-dip trotline.

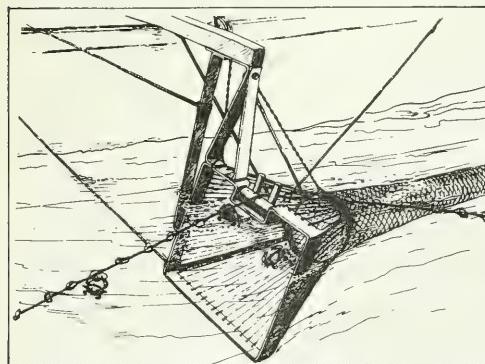


Fig. 8 - The patent dip is attached to a boom which may be hoisted up against the mast or lowered, as shown here, to a horizontal position when fishing the line, with the top of the dip at the surface of the water.

Until the early 1940's it consistently accounted for two-thirds of the entire Bay catch of hard crabs, but in recent years, since watermen abandoned trotlines in favor of pots, less than 10 percent of the Virginia hard crab catch and about 43 percent of the Maryland catch has been obtained with trotlines.

PATENT-DIP TROTLINE

The patent-dip trotline differs from the hand-dip trotline only in the method by which crabs are dipped out of the water (fig. 8). The patent-dip consists of a rectangular or cylindrical cage about 3 feet square made of a framework of iron strips and rods. To the bottom is attached a cylindrical net of heavy twine, about 10 feet long, which is closed at the end with a piece of light twine. The iron cage is attached by heavy iron straps to a boom or spar which may be hoisted up against the boat mast or lowered to a horizontal posi-

tion. When the boom is lowered, the cage lies in the water with the upper edge at the surface. On this upper rim of the cage are two upright pegs about 5 inches apart, and a roller. When the crabber starts his run of the trotline, he places the line over the roller between the upright pegs. Then as the boat cruises along the set, the line is lifted off the river bottom and over the roller. As they reach the surface, crabs drop into the iron cage and are caught in the trailing net. When the net is full, the boom is hoisted to an upright position, the tie-string at the end of the net is loosened, and the crabs are dumped into a barrel or into the bottom of the boat.

The patent-dip rig permits the waterman to run more sets than could be made with a hand-dip trotline, for culling of illegal crabs can be made any time after the catch has been made. Watermen claim that in early spring and late fall trotlines yield higher catches than pots. Crabs are less sensitive to bait odors when the water is cool. Trotline baits 2 to 4 feet apart are more quickly located than bait in pots spaced at intervals of 100 or more feet.

Since 1920, when patent-dip trotlines were first licensed, the number of licenses issued yearly in Virginia has been small and variable. Licenses are not considered a reliable index of the number of gear actually used, for crab pots or patent-dips may be used by holders of either license. Patent-dips have never been used in Maryland waters.

DREDGE BOAT

The dredge boat (fig. 9) varies from less than 32 to over 60 feet in length, 5 net tons or more, and carries a captain and a crew of two or three. On larger boats two dredges are towed simultaneously from opposite sides of the boat, the chain from each dredge passing



Fig. 9 - Dredge boats, often Diesel-propelled, are from 32 to 60 feet in length, five net tons or more, and tow two dredges simultaneously from opposite sides.

over a roller on the boat's rail, around a center post and then below deck to a windlass operated from the pilothouse (fig. 10). Smaller boats often drag a single power-drawn dredge over the stern.

The heavy metal dredge consists of a rectangular iron frame, bearing a 6-foot, toothed drag bar on its lower edge and carrying a mesh bag made up of rings and cotton twine. The bag will hold between 3 and 4 bushels of crabs. The iron teeth, welded on the drag bar, are about 4 inches long and about $1\frac{1}{2}$ inches apart. A metal bridle attached to the dredge frame bears an eye to which the hauling chain is fastened. The length of a dredge, from the drag bar to the eye of the frame, varies with the amount of space available when the dredge is hauled on deck to be emptied, but should be about 6 inches less than the distance from the top of the dredge post to the roller.

Dredging is almost the only means of obtaining crabs from December through March, when the "crab-biting-rate" is almost zero and movements of crabs are minimal. Dredging is limited by law to the lower Bay and to the small bays on the ocean side of the eastern shore. Concentrations of crabs in the lower part of the Chesapeake during the winter occur as a result of the fall migrations of adult female crabs from the rivers and upper Bay following mating (Van Engel 1958). The best catches are made on the edges of broad banks adjacent to deep channels of the Bay, over "grassy,"⁵ muddy-sand bottoms, in 25- to 75-foot depths. During an average fishing day from 65 to 100 ten-minute dredge hauls can be made, lifting the dredges alternately.

The dredge catch is highest in early December and becomes progressively smaller as the season advances. Approximately 85 percent of the crabs caught are adult females, and the remaining 15 percent are males and immature crabs of both sexes. About half the total catch is landed on the west shore of the Bay between the Piankatank River and the James River. The other half is landed on the Eastern Shore, principally for sale in Maryland markets.

Since the winter dredge fishery began in Virginia about 1900, there have been few changes in methods of dredging or in the gear. Dredges have been similar to those now in use, but varying from 4 to 6 feet in width. Before 1920, gasoline and semi-Diesel engines developing 20 to 60 hp. were in common use. Since then there has been gradual replacement by engines of higher horsepower. Dredge-boat captains unanimously believe that this change has increased daily catches, by shortening the running time from port to fishing grounds and thus permitting more time for dredging, rather than by increasing the average catch per dredge haul.

The "Geraldine," an 11-net-ton Gloucester County vessel, may be considered representative of the majority of vessels now used in the fishery. Built in 1928, she was first equipped with a 24 hp. Lathrop, a marine, gasoline engine with a straight drive and no clutch. Other dredgers were using 24 to 35 hp. Palmer, marine, gas engines, and a few of the larger vessels had 45 to 65 hp. Fairbanks-Morse, marine, semi-Diesels, all straight drive with clutch. A 50 hp. 20th Century, marine, gas engine was installed in the "Geraldine" in 1932. This in turn was replaced in 1944 with a 144 hp. Chrysler Royal gas engine converted for marine use and had a 3:1 reduction gear. A 165-hp. Gray marine Diesel with a 2:1 reduction gear was installed in 1946; this Diesel has had three major overhauls in the last 16 years and is still in use.

⁵Beds of colonial hydroids, *Thuiaria argentea*.



Fig. 10 - The crab dredge.

The number of boats dredging hard crabs in the Bay in the earliest years of the fishery is unknown, for they were often reported with boats dredging in ocean waters and sail boats scraping peeler crabs in summer. Since 1921, the number has increased from 50 to about 110 vessels (fig. 1).

On the ocean side of the eastern shore of Accomack and Northampton counties of Virginia, $3\frac{1}{2}$ to 6 foot dredges were once used. Since 1937 dredges have been limited to 3 feet in width and must be hand-drawn, not power-lifted, into the boat.

Since its inception, the Virginia dredge fishery has landed from 10 to 30 percent of the total Virginia hard crab catch and at present accounts for about 20 percent of the landings. About 4 percent of the winter catch comes from the ocean-side bays.

Dredging was first permitted in Maryland in the winter of 1947-1948. Three-foot wide, hand-drawn dredges are now used in Chincoteague Bay, Sinepuxent Bay, Isle of Wight Bay, and Assawoman Bay and their tributaries in Worcester County, Md. (fig. 2). The Maryland winter catch is about one-third of the Virginia oceanside catch.

When trotline and pot catches in late November or early April are very low and insufficient numbers of crabs are being landed or shipped in to meet market demands, the Virginia Commission of Fisheries may permit crab dredging to begin as early as November 16 or last until April 16.

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TRENDS AND DEVELOPMENTS

Fishing Vessel and Gear Developments

EQUIPMENT NOTE NO. 13--

SOVIET TRAWLERS OBSERVED IN GULF OF ALASKA:

On May 5, 1962, two Soviet trawlers were observed by the U. S. Bureau of Commercial Fisheries research vessel John N. Cobb on the Albatross Gully grounds (vicinity of 57° 59' N. latitude, 149° 51' W. longitude) in the Gulf of Alaska (fig. 1). These grounds are heavy producers of halibut for the United States and Canadian long-line fleets. They also yielded up to ten metric tons of Pacific ocean perch (*Sebastodes alutus*) per hour of Soviet exploratory trawling in 1960 (Moiseev and Paraketsov 1961). The Albatross Gully grounds, along with grounds south of Unimak Island and southwest of the Shumagin Islands, are considered likely areas for expansion of the Soviet's Pacific ocean perch trawl fishery.



Fig. 1 - One of two similar Soviet trawlers encountered May 5, 1962, by M/V John N. Cobb in the Gulf of Alaska.

The Soviet vessels observed from the John N. Cobb were identical side trawlers with estimated lengths of 160 to 170 feet. They bore identification numbers SRT-R-9162 and SRT-R-9165. Twenty-two crew members (including one woman) were observed on deck of one vessel when first contact was made.

Otter boards used by the Soviet trawlers were oval-shaped and were used to spread a large trawl net of synthetic construction



Fig. 2 - Soviet trawler hauling net containing an estimated 15,000 pounds of Pacific ocean perch.

which appeared to be rigged to fish just above the bottom (fig. 2). The net may have been a bottom herring trawl of the type reported adopted for Pacific ocean perch fishing in the Gulf of Alaska (Lubimova 1961). An estimated 80 to 100 metal floats were observed attached to the headrope of the net and there were about 12 droppers, each about one-fathom long, spaced along the footrope of the net. One "sash weight" estimated to weigh about 40 pounds was attached to the end of each dropper. When the sash weights contact the bottom, the reduced weight on the footrope apparently allows the net to raise enough to clear small obstructions. The wings and intermediate section of the net appeared to be of double mesh construction. No gilled fish were seen in two catches observed at close range.

A tracing of the net used by one of the Soviet trawlers was obtained on the John N. Cobb's white-line echo-sounder (fig. 3). The tracing clearly shows the trawl warps and outline of the trawl while it was fishing at a



Fig. 3 - Echo tracing obtained from M/V John N. Cobb of Soviet trawl warps and net at depth of 120 fathoms.

depth of 120 fathoms. The proportion of the vertical scale on the echo-sounder tracing occupied by the net indicates the net's head-rope was from 25 to 30 feet above the ocean bottom.

An estimated 15,000 pounds of Pacific ocean perch were caught in the haul from which the echo tracing was obtained. A subsequent haul, when the net apparently snagged on a bottom obstruction, yielded an estimated 3,000 pounds of Pacific ocean perch. Both catches were dumped directly into the vessel's hold, which prevented accurate observation of the species caught. However, no species other than Pacific ocean perch could be seen in the net while it was alongside the vessel or when the catches were lifted aboard.

A great deal of echo-sounding was done by the Soviet trawlers prior to actual setting of their nets. This apparently was necessary to determine the type of bottom and to locate schools of Pacific ocean perch. The two trawlers coordinated their echo-sounding and trawling for maximum efficiency of operations.

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Alaska

SOVIET AND JAPANESE FISHING OFF ALASKA, JUNE 1962:

Soviet and Japanese fishing efforts in the Bering Sea and Gulf of Alaska remain high. In the Bering Sea, fishing concentrations appear to have shifted westward, except for the king crab mothership operations of both nations. At last report, the Japanese king crab mothership Tokei Maru was operating just north of Cold Bay. The Soviet king crab vessel Andrey Zakharov was last reported just off Port Moller.



Fig. 1 - Russian king crab factoryship Andrey Zakharov, operating in Bering Sea, July 5, 1961.

Two Japanese shrimp factory vessels were working northwest of the Pribilof Islands at approximately 58° N. 170° W. The two vessels are the Einin Maru and the Kaiko Maru. The Einin Maru's production target is 300,000 cases for 1962. As of June 15 this vessel had produced over 100,000 cases. At the present rate of production, the factoryship is expected to reach its target. She has been on the fishing grounds since May 1 and has been producing an average of 2,500 to 3,000 cases of shrimp a day. The Kaiko Maru is known to be taking large quantities of shrimp also; however, neither her production target nor her fishing success is known.



Fig. 2 - Japanese shrimp factoryship Einin Maru, Bering Sea, June 27, 1961.

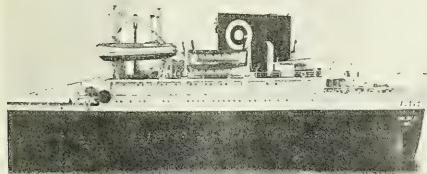


Fig. 3 - Japanese whale factoryship Tonan Maru, operating in Bering Sea, July 11, 1961.

Both Japanese and Russian whaling vessels have been reported in considerable numbers along the Aleutian Chain. Most of the activity has been centered around the Amchitka Pass and Rat Islands. The Japanese in particular seem to be having good success this year. Twice they have been observed to find and take a complete school of whales.

Japanese motherships fishing for salmon have not fished in the Bering Sea but have remained south of the Aleutian Islands and west of the 180th parallel, at least during the period from June 7 to June 24.

Soviet and Japanese exploratory vessels have been sighted in many areas of the Gulf. The Japanese exploratory fishing trawler Izumo Maru was prospecting about 100 miles south of Seward. The Russian trawler CT 4454 was sighted approximately 30 miles off Biorka Island near Sitka on June 22. The vessel was believed fishing for ocean perch. At last report, a considerable number of Russian and Japanese trawlers were working near the Trinity Islands off Kodiak.

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SALMON FISHERY TRENDS, JUNE 1962:

Southeastern Alaska: Due to the continued failure of the early runs of salmon to northern waters of Southeastern Alaska, the Icy Strait district and Western district were closed to salmon purse-seining until July 10. Pink salmon to date have been of extremely small size and the number of chum salmon was disappointing. At last report, the only district open to purse-seining in Southeastern Alaska was the outside section of the west coast district.

Central Alaska: The salmon runs to Central Alaska are apparently stronger this year. The Cordova district, which includes the Copper and Bering Rivers, has packed 2,411 cases of kings and 58,866 cases of reds. This indicates a very good run for the Cordova district.

Western Alaska: The red salmon run to Bristol Bay appears to be shaping up about as expected. Last year at this time the pack of red salmon amounted to 303,382 cases. To date this year the pack is 61,091 cases.

* * * * *

HERRING FISHERY:

The herring reduction fishery in Alaska for 1962 began on June 12. The only reduction plant operating this season is the one located at Washington Bay. Although only 3 seiners are fishing, the catches have been so heavy the plant has been unable to keep pace with the deliveries. Approximately 450 tons of herring had been delivered by June 17. The age composition of the catch during the first week was: 19 percent 4-year-old fish, 67 percent 5-year-olds, 13 percent 6-year-olds, and 1 percent 7-year-olds. Catch per unit of effort has been 820 pounds per ton day. This approaches the maximum catch per unit of effort obtained in 1961.

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TANNER CRAB FISHERY:

Trawling explorations in Southeast Alaska for marketable tanner crabs (*Chionocetes bairdii*), undertaken in mid-May by a Juneau firm with the vessel Neptune, were discontinued in mid-June after a thorough search failed to reveal commercial concentrations in trawlable waters. Depths from 10 to 110 fathoms were surveyed near Juneau, in Icy Strait, Northern Lynn Canal, and offshore at Cape Fairweather. The catch in each area averaged 100 market-size tanner crabs per one hour drag; about 50 percent of the crabs had recently moulted and were soft.



Alaska Fisheries Investigations

The following is a report of June 1962 activities and studies by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Auke Bay, Alaska.

HERRING INVESTIGATIONS:

The herring tag recovery apparatus at the Washington Bay herring reduction plant was activated early in the month. This operation is part of a biological research study to define the contributions of various stocks of herring to the commercial fishery, to plot migration routes, and to obtain an estimate of natural and fishing mortality in herring populations.

* * * * *

SALMON FRY MIGRATIONS:

The salmon fry migration from Grassy Point Creek at Karluk Lake dropped to a very low level in the first week of June, whereas the Meadow Creek run peaked at that time. Both camps were closed by June 23, with the arrival of adult reds off the creek mouths. Between 266,000 and 327,000 fry migrated from Grassy Point into Karluk Lake during the study period. Meadow Creek contributed between 650,000 to 728,000 fry during the same period. The smolt out-migration from Karluk Lake for the period May 18 through June 23 was estimated at 1,494,000. This estimate includes both tails of the migration curve. The spring adult red salmon migration into Karluk Lake up to and including June 21 has totaled 104,494 spawners. The run was sampled every fourth day to obtain length, sex, and age data. Four high-seas tagged reds had passed through the weir.

* * * * *

BRISTOL BAY RED SALMON STUDIES:

The red salmon out-migration from the Naknek Lakes was the largest since the Naknek smolt studies started in 1956. This year an estimated 15,000,000 red salmon smolt left the Naknek Lakes. The previous peak year was 1959, when the smolt out-migration was estimated at 12,000,000. The Ugashik River smolt out-migration was very large also, with the index catch being within a few thousand of the 1958 peak index catch of 456,000. The out-migration estimate for this year is nearly 16,000,000, while the 1958 out-migration estimate was 11,000,000.

* * * * *

KING CRAB STUDIES:

All research data collected by the Bureau's Montlake Biological Laboratory on king crab south of the Alaska Peninsula have been transferred to the Auke Bay Biological Laboratory in Alaska. The Auke Bay Laboratory

is now responsible for tag recovery and analyses of king crab data resulting from the trawl survey conducted in cooperation with the International Pacific Halibut Commission. In mid-June, the Commission began a second trawl survey of the continental shelf bordering the Gulf of Alaska. Operations will extend from Kodiak Island to Cape Spencer and will use three trawlers. Plans were made to place a Bureau observer aboard one Commission vessel which will operate out of Kodiak. Arrangements have also been made to charter the 80-foot vessel Paragon to tag king crabs in the offshore waters between Chirikof Island and the Shumagin Islands.

* * * * *

PACIFIC HERRING MAY BE SERIOUS PREDATOR OF PINK SALMON FRY:

Studies of the early salt water life of pink salmon at Little Port Walter in southeastern Alaska indicate the Pacific herring may be a serious predator of pink salmon fry in that area, according to an article in the latest Transactions of the American Fisheries Society, an international fisheries research publication.

In May 1960, the stomach contents of 537 herring were examined by the author of the article. The fish had been caught by beach seines and gill nets fished in the bay near the stream mouth during the peak of the pink salmon fry migration. He found that 286 herring stomachs held pink salmon fry. The average number of fry in each stomach was 14.

The author, who is a biologist at the U.S. Bureau of Commercial Fisheries Laboratory at Auke Bay, Alaska, stated that herring appear in the bay at Little Port Walter occasionally throughout the year. He said the herring often concentrate there in large schools during the spring and summer months, the same time young pink salmon enter salt water from the spawning streams.

Observations by other biologists confirm the report of herring eating salmon fry. A biologist for the Fisheries Research Institute, University of Washington, observed herring chasing and eating salmon fry in Uyak Bay, Kodiak Island, during 1958 and 1959. He examined the stomachs of herring caught by beach seine in Browns Lagoon, Uyak Bay, and found as many as 10 fry in a single herring stomach. In 1962, another Bureau of Commercial Fisheries biologist

repeated many of the observations made by the author of the article on herring predation upon pink salmon fry entering the Little Port Walter estuary.

The addition of herring to the list of salmon predators does not necessarily mean that predation by herring is general. According to the Auke Bay Laboratory biologist, the extent and areas of predation are not known. He pointed out, however, that the Little Port Walter observations, and those made at Uyak Bay, demonstrate that predation upon salmon fry by herring does occur in widely separated areas, and has been observed upon several occasions in different years.



Alaska Fisheries Exploration and Gear Research

TRAWLER CHARTERED FOR KING CRAB EXPLORATIONS:

The steel-hulled Seattle trawler Yaquina, a 75-foot vessel, was selected in June 1962 for this summer's work by the Bureau's Exploratory Fishing and Gear Research Base, Juneau. A contract charter was signed early in July. The vessel departed for Portlock Bank near Kodiak Island to begin a six-week survey of the commercial potential of king crab and associated stocks. The vessel is expected to be used continuously until November on two additional six-week surveys, one for Sewardarea shrimp explorations and the other for Southeastern Alaska bottomfish explorations.



American Dietetic Association

ANNUAL MEETING:

The 45th Annual Meeting of the American Dietetic Association will be held in Miami Beach, Fla., October 9-12, 1962. Daytime sessions for the first three days will be held at the Auditorium where an extensive exhibition of food service equipment and food products will be on display. On the last day, sessions will be held at the Deauville and Carlton, the joint headquarters hotels.

Several sessions will be devoted to diet and nutrition. Attention will be given to atherosclerosis and one of the speakers on

this subject will talk on "Fats, Rats, Chicken, and Men." A session on obesity and weight control will include a talk on "Nutritional Deficiencies in Other Parts of the World." Disaster feeding and civil defense will be considered at another session.

Food service administration will be the subject of another session. An associate professor of Michigan State University will talk on new trends in foods. Another speaker will talk about producing quality foods. One speaker will discuss merchandising food, and another, "New Trends in Food."



California

MIDWATER TRAWLING FOR SALMON FINGERLINGS CONTINUED:

M/V "Nautilus" Cruise 62-N-6b (June 11-15, 1962) and 62-N-6c (June 25-29, 1962): The capture of marked salmon fingerlings on their seaward migration was the objective of both trips by the California Department of Fish and Game research vessel Nautilus. The vessel operated in the Carquinez Strait, using a cotton midwater trawl with a 15-foot square opening. Trawling was conducted between 8 a.m. and 3 p.m., and each tow lasted 20 minutes. All tows were alternated between upstream and downstream, and between north shore, center, and south shore of the channel.

Other Species Caught by Nautilus on Cruise 62-N-6b and 62-N-6c

Species	Number
Northern anchovy (<i>Engraulis mordax</i>)	46,000 (est.)
Pacific herring (<i>Clupea pallasi</i>)	11,500 (est.)
Striped bass (<i>Morone saxatilis</i>)	3,600 (est.)
Sacramento smelt (<i>Spizostethus thaleichthys</i>)	2,000 (est.)
King salmon (<i>Oncorhynchus tshawytscha</i>)	755
Northern midshipman (<i>Porichthys notatus</i>)	25
American shad (<i>Alosa sapidissima</i>)	24
Spottail (<i>Pogonichthys macrolepidotus</i>)	24
Jacksmelt (<i>Atherinopis californiensis</i>)	13
Starry flounder (<i>Platichthys stellatus</i>)	9
Surfsmelt (<i>Hypomesus pretiosus</i>)	7
Staghorn sculpin (<i>Leptocottus armatus</i>)	2
Walleye surferch (<i>Hyperoplus argenteum</i>)	2
Rainbow trout (<i>Salmo gairdneri</i>)	1
Pacific lamprey (<i>Entosphenus tridentata</i>)	1
Shiner perch (<i>Cymatogaster aggregata</i>)	1
Sacramento squatfish (<i>Ftychocheilus grandis</i>) ¹	1
Night smelt (<i>Spizostethus starksi</i>)	1
Three-spined stickleback (<i>Gasterosteus aculeatus</i>)	1
1/New species appearing for first time since midwater trawling operations began on April 10, 1961.	

A total of 109 tows completed in the Strait during the cruises yielded a total

catch of 755 king salmon (*Oncorhynchus tshawytscha*). Nineteen of these fish were marked recoveries.

Note: See Commercial Fisheries Review, August 1962 p. 9.



Cans--Shipments for Fishery Products, January-May 1962

The amount of steel and aluminum consumed to make cans shipped to fish and shellfish canning plants during January-May 1962 was 0.4 percent above that used during the same period in 1961.



Prior to this year, the figures covered only tinplate cans, but beginning with January 1962 aluminum cans are included. It is believed that only a small amount of aluminum is being used in cans used for fishery products at present.

A total of 1,222,507 base boxes of steel (tinplate) and aluminum were used in the manufacture of cans shipped to fishery plants during the first five months of 1962, whereas in the same period of 1961 (when only tinplate was reported), 1,217,306 base boxes of steel were consumed. More tuna, Maine sardines, and mackerel were canned in the first five months of 1962 than in the same period of 1961.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size.



Central Pacific Fisheries Investigations

TUNA STUDIES IN SOUTH PACIFIC CONTINUED:

M/V "Charles H. Gilbert" Cruise 56 (April 24-May 12, 1962): Long-line fishing for tuna and other climax predators in waters adjacent to Christmas Island was conducted during this cruise by the U. S. Bureau of Commercial Fisheries research vessel Charles H. Gilbert. The specimens obtained were to be used for studies by the University of Washington Laboratory of Radiation Biology.

Five long-line fishing stations were occupied at designated locations shown in figure 1. Sixty baskets of 180-fathom mainline gear

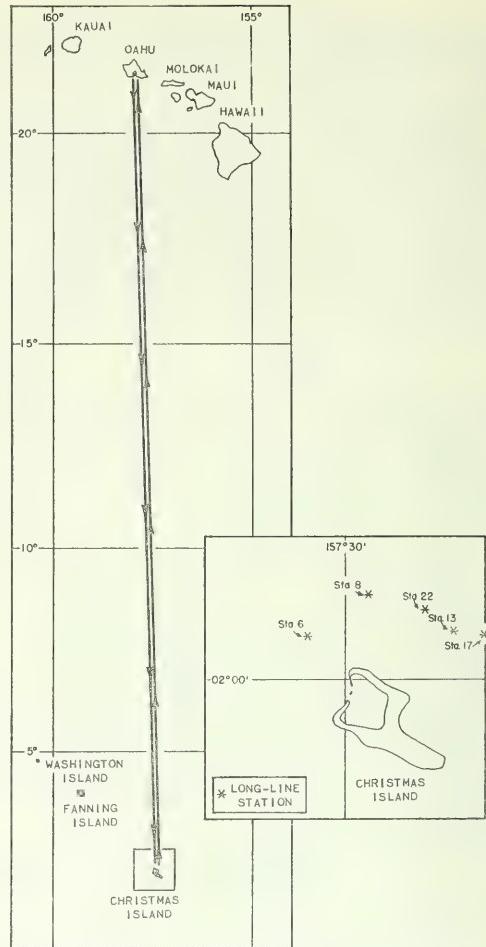


Fig. 1 - Track chart of Charles H. Gilbert Cruise 56 (April 24-May 12, 1962).

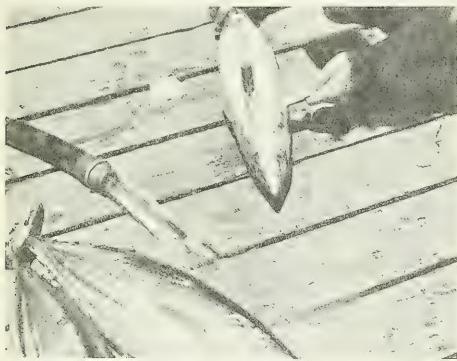
with 16-fathom droppers were fished at stations 6, 8, 13, and 17, and 20 baskets of similar gear were fished at station 22. The catch rate of tuna (per 100 hooks) ranged from 1.1 at station 6 to 21.9 at station 13. A total of 154 yellowfin tuna, 9 big-eyed tuna, 1 wahoo, 1 sailfish, 1 black marlin, 1 lancetfish, and 15 sharks were caught at the 5 long-line stations.

Samples of eyes, liver, and muscle were taken from 51 yellowfin tuna, 6 big-eyed tuna,

1 wahoo, and 2 spearfish. Livers were taken from 3 sharks. Those samples, which were taken from long line-caught fish, were frozen for further study by the University of Washington.

Plankton and nekton were collected with 1-meter plankton nets and a 6-foot Isaac-Kidd midwater trawl. Eight 30-minute 0-50 meter oblique plankton tows and three 30-minute surface plankton tows were made with a 1-meter open net. A non-quantitative portion approximately one-fourth of each sample was preserved in formalin. The remainder was frozen. Settling volumes ranged between 205 and 250 ml. Three hauls with the 6-foot midwater trawl were made to a depth of approximately 70 meters.

Water samples were collected to a depth of 1,200 meters using bottle casts. Six Nansen bottle casts (without reversing thermometers) were made to obtain water samples at the following depths: 25, 50, 100, and 300 meters. A five-gallon surface sample was obtained at each of the six stations by bucket.



Collecting tuna blood sample.

Blood samples were collected from tuna and marlin for serological studies at the Bureau's Biological Laboratory, Honolulu. A total of 142 blood samples were obtained from 131 yellowfin tuna, 9 big-eyed tuna, 1 black marlin, and 1 sailfish.

Eighty-two BT casts and collections of surface salinity samples were made on runs between Honolulu and Christmas Island. Casts were made at intervals of approximately 30 miles. Four BT casts were made in the survey area with a surface salinity

sample collected at each. During this cruise, two night-light stations were held in the survey area, and the thermograph was operated continuously.

Four skipjack tuna schools and 17 unidentified schools were sighted during the cruise.

On the run between Honolulu and Christmas Island, one case of drift bottles (20 bottles per case) was dropped each hour for the first 6 hours after departure, and after that, one case was dropped every 3 hours until 15° N. On the return trip, one case of drift bottles was dropped at 15° N. and one case 3 hours later.

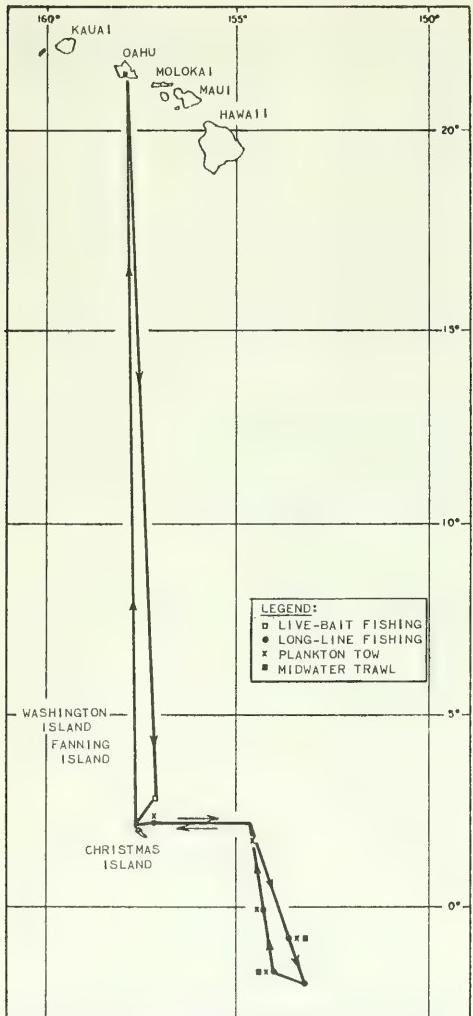
M/V "Charles H. Gilbert" Cruise 57 (June 4-25, 1962): This cruise in the Line Islands area, principally off Christmas Island, by the Charles H. Gilbert was also concerned with long-line fishing for tuna and other climax predators needed as specimens in studies by the University of Washington.

Five long-line fishing stations were occupied at the locations shown in figure 2. Sixty baskets of 6-hook, 210-fathom mainline gear with 16-fathom droppers were fished at each station. The catch rate of tuna (per 100 hooks) ranged from 1.1 at station 16 to 3.9 at station 21. A total of 28 yellowfin tuna, 3 big-eyed tuna, 12 skipjack tuna, 1 wahoo, 1 striped marlin, 1 lancetfish, and 21 sharks were caught at the five long-line stations.

Samples of eyes were taken from 8 yellowfin and 2 skipjack tuna; samples of liver from 27 yellowfin, 3 big-eyed, and 12 skipjack tuna, 1 wahoo, 1 striped marlin; samples of muscle from 27 yellowfin, 3 big-eyed, 12 skipjack tuna, 1 wahoo, 1 striped marlin. The tissues were taken from long-line-caught fish and frozen for further study by the University of Washington.

Plankton and nekton were collected using 1-meter plankton nets and a 6-foot midwater trawl. Thirteen 30-minute 0-50 meter, one 0-100 meter oblique plankton tows, and five 30-minute surface plankton tows were made with a 1-meter open net. Settling volumes ranged from 75 to 1,150 ml. Two hauls with the 6-foot midwater trawl were made to a depth of approximately 55 and 64 meters, respectively.

Water samples were collected to a depth of 300 meters with bottle casts. Five bottle



casts (without reversing thermometers) were made to obtain water samples at depths of 25, 50, 100, and 300 meters. A 5-gallon surface water sample was obtained at each station by bucket.

Blood samples for serological studies were collected from: (1) up to 300 skipjack

taken by live-bait fishing methods, (2) 191 skipjack and 2 yellowfin tuna caught by live-bait fishing at $03^{\circ}08'N$, $157^{\circ}01'W$, (3) all tunas and marlins taken by long-line fishing, and (4) 28 yellowfin, 3 big-eyed, and 12 skipjack tuna, 1 wahoo, 1 striped marlin (all of these were caught by long line). Other biological and oceanographic data were collected.

M/V "Charles H. Gilbert" Cruise 58 (July 10-19, 1962): The Hawaiian waters from Oahu to French Frigate Shoals were explored during this cruise by the Charles H. Gilbert.

A total of 37 fish schools (based on sightings of bird blocks) were recorded during the period. Twenty-two of the schools were observed while within the area of the fishery, including the first scouting leg west of Niihau, and 15 schools were observed to the west. One school was composed of yellowfin tuna estimated to consist of fish weighing 125 pounds each, 7 were skipjack, and 29 were unidentified.

One yellowfin, 1 unidentified, and 4 skipjack schools were fished, with a catch from two schools of 39 skipjack. Both the schools were fished in an area 40-60 miles west of Niihau--16 skipjack averaging 25 pounds each were caught from one school and 23 $4\frac{1}{2}$ - pound skipjack from a second school.

Other results of the cruise were:

1. Nine night and 6 daylight surface plankton collections were made using a 1-meter net.
2. Sixteen blood samples were collected from the 25-pound skipjack caught about 60 miles west of Niihau.
3. Trolling for 104 hours resulted in a catch of 13 little tunny, 6 yellowfin, 1 skipjack (4 were lost), 3 dolphin (1 lost), and 1 wahoo. Two little tunny and 2 yellowfin were returned for skeletal studies.
4. Drift bottles and cards were released in groups of about 100 at four locations off eastern Oahu, namely Manana Island, Kailua Bay, Mokolii Island, and Laie Point.
5. Live bait was obtained from three sources: (a) mosquito fish from airport drainage ditches, (b) tilapia from the State Fish and Game bait plant, and (c) iao from French Frigate Shoals.

Note: See Commercial Fisheries Review, June 1962 p. 8.

Crab Meat

NEW CRAB-PICKING MACHINE INVENTED:

A power-driven crab-picking portable machine that could revolutionize crab processing has been invented in North Carolina. Francis Altman, the inventor, who is manager of a crab-processing plant in Oriental, N. C., believes that the machine is the first of its kind to use a dry process. The inventor holds the patent rights jointly with another resident of Oriental, N. C. The latter and his brother jointly own two crab plants in North Carolina which process and pack a pasteurized brand of crab meat—one is located in Oriental and the other in Whortonsville.

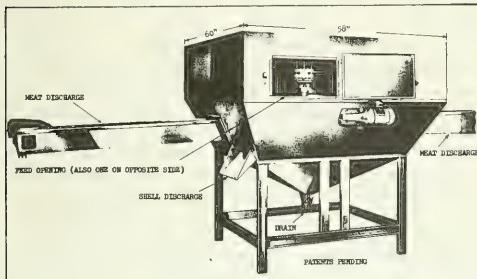


Fig. 1 - Sketch of crab-picking machine. Shows some detail of the various parts of the machine.

Built of stainless steel, the portable machine is fed from two sides. The meat is separated from the shell cleanly, and then comes out on a conveyor and is raked into cans. The crab meat is still encased in the shell when it is fed into the machine that the patent-right holders have named "The Crab Master." Three people are needed to operate the machine. Two feed it, the other rakes in the meat. Some 15 to 17 workers will be required to "deback" and "bob" the crabs before they can be placed in the picking machine. By hand the crab is first debacked—that is, its hard top shell is removed; then its meaty portions are cut into pieces about the size of ordinary cup cakes. These portions are placed by women into rotary cups. Each of the rotary containers has eight unit heads. The portions fit snugly in the cups. A fast worker can feed the bobbed portions into each side of the machine at a rate of up to 150 per hour.

"This machine," the inventor states, "will actually do the work of 60 to 70 workers and require the services of not more than 20 persons in the course of an eight-hour work day." This means that the machine and 20 workers can process as much crab meat in an eight-hour day as 60 to 70 women workers now produce by using the age-old method of picking the meat from the shells by hand.

Altman spent more than two years in building the crab meat picker. The machine costs about \$8,000 to build. The inventor has demonstrated his machine to crab processors in North Carolina and other states. The North Carolina Board of Conservation and Development and its chairman, the Governor of North Carolina, have expressed great interest in the new machine.

The machine will be manufactured by a company in Baltimore, Md. Plans at present are to build at least 12 of the machines in addition to the prototype model the inventor is now demonstrating. The present holders of the patent rights plan to retain the patent rights. They plan to lease the machine to crab processors at the rate of about \$3 per hour. The machine will not be sold outright.

Crab processing is a fast-growing industry in North Carolina. In 1961, according to the U. S. Bureau of Commercial



Fig. 2 - Francis Altman, right, beside the crab-picking machine he invented. At Oriental, N. C., a crab-processing plant employee feeds bobbed crabs into the machine where the meat is separated from the shell. The machine is patented.

Fisheries, North Carolina ranked fourth in landings of hard blue crabs in the Nation with a record of more than 16 million pounds. Under North Carolina law, blue crabs can be taken year-round.

Pasteurized crab meat is taking its place in the crab industry of North Carolina. North Carolinians eat some crab meat, but the State's processors find their best markets for about all they can process in Baltimore, Philadelphia, and New York City, where it is shipped daily under contract. (News release dated July 15, 1962, from the North Carolina Department of Conservation and Development.)



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-JUNE 1962:

Fresh and Frozen: For the use of the Armed Forces under the Department of Defense, less fresh and frozen fishery products were purchased in June 1962 by the Defense Subsistence Supply Centers than in the previous month. The decline was 6.8 percent in quantity and 7.6 percent in value.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, June 1962 with Comparisons

QUANTITY				VALUE			
June	Jan.-June	June	Jan.-June	June	1962	1961	June
1962	1961	1962	1961	1962	1961	1962	1961
2,357	(1,000 Lbs.)	11,973	10,872	1,328	(\$1,000)	6,762	5,311

Compared with the same month a year earlier, purchases in June 1962 were up 48.0 percent in quantity and 89.2 percent in value. This shows that higher-priced fishery products were purchased this June because the value of the purchases increased

much more than the quantity. During the first six months of 1962, purchases were up 10.1 percent in quantity and 27.3 percent in value as compared with the same period in 1961. Again, because of the purchase of higher-priced fishery products and an increase in the price of most fishery products, the value increased more than the quantity.

Prices paid for fresh and frozen fishery products by the Department of Defense in June 1962 averaged 56.3 cents a pound, 0.6 cents a pound less than in the previous month, but 12.2 cents a pound more than in the same month of 1961.

Table 2 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, June 1962 with Comparisons

Product	QUANTITY				VALUE			
	June		Jan.-June		June		Jan.-June	
	1962	1961	1962	1961	1962	1961	1962	1961
Tuna . . .	1	-	3,707	2,662	1/	-	2,062	1,175
Salmon . . .	-	-	1,015	2	-	-	638	2
Sardine . . .	18	1	50	90	9	1	25	44
1/Less than \$1,000								
								(\\$1,000)

Canned: Canned sardines were the principal canned fishery product purchased for use of the Armed Forces in June this year. For the first six months of this year purchases of canned tuna and salmon were up substantially as compared with the same period of 1961. But purchases of canned sardines during the first half of 1962 were down because of the short packs of both Maine and California sardines during 1961. Purchases of the three principal canned fishery products (tuna, salmon, and sardines) in the first 6 months of 1962 were up 73.3 percent in quantity and 123.2 percent in value as compared to the same period in 1961. The greater increase in value was due to larger purchases of canned salmon and an increase in the price of canned tuna.

Note: Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.



Fish Meal

NEW PLANT PROPOSED FOR CAPE CHARLES, VA.:

A new fish meal processing plant is planned at Cape Charles, Va. The plant will be in operation early in 1965, according to the "Virginia Pilot," a Norfolk, Va., news-

paper. The new facility will represent a plant investment of about \$1,750,000 with an annual payroll of from \$300,000 to \$400,000. An industry spokesman stated the operation will be carried on by a wholly-owned firm.

The factory is estimated to cost \$750,000 and will be located on Cape Charles Harbor on land owned by the Pennsylvania Railroad. The remainder of the plant investment will go for a fleet of six vessels costing from \$150,000 to \$200,000 each. It was reported that about 100 men will be employed on the vessels, and some 50 persons in the plant.

The firm building the plant now operates plants in Wildwood, N. J., Moss Point, Miss., and Reedville, Va., but the Reedville plant will be closed when the Cape Charles operation begins. It was reported that the firm was approached by both the Cape Charles township and by the Railroad concerning location of the plant. One of the advantages of the location is that it is nearer to both Chesapeake Bay and Atlantic fishing areas than Reedville. Another advantage is that the plant's products can be shipped by rail from Cape Charles, which is not the case at Reedville.



Fishy Odors and Flavors

PROGRESS ON STUDIES TO DATE (JUNE 1962):

In 1955 the U. S. Bureau of Commercial Fisheries initiated its first program on the chemistry of fishy odors and flavors by awarding a contract for the study to the Hormel Institute, University of Minnesota, Austin, Minn. At that time, the potential causes of such fishy odors and flavors had not been thoroughly understood. The assumption was made that the primary cause of such odors was an oxidative splitting of the polyunsaturated fish oil fatty acids to shorter chain carbonyl compounds, some of which possess fishy odors and flavors.

Dr. Jacques Chipault of the Hormel Institute began a comprehensive investigation of the chemistry of the oxidation of fish oils. Menhaden oil was oxidized by aeration and the numerous carbonyl compounds as musty, stale, sharp-acrid, putrid, and sweet.

Work on Odors and Flavors at the Seattle Laboratory: Quite independent of the fish oil

program, the Bureau's Technological Laboratory at Seattle conducted a study aimed at finding the chemical nature of compounds responsible for the fishy odors and flavors resulting from spoilage of the protein and other nitrogenous components of fish. This work was started by David Miyauchi in 1956 and continued after 1957 by Dr. Herman Groninger. Maurice E. Stansby, the Director of the Laboratory, noted that many of the odors being found associated with spoiled fish in this research by Miyauchi and Groninger seemed also to occur in many of the menhaden oils mixed in with various rancid or otherwise oxidative types of odors.

Stansby, therefore, carried out some experiments, some of which were first reported at a conference of fishery technologists at Davis, Calif., 1959. This work was continued and a paper, "Speculations on Fishy Odors and Flavors," appeared in Food Technology, April 1962 (pages 28-32). In this paper the idea is presented that we should not distinguish sharply between fishy flavors in spoiling fish resulting from bacterial decomposition and fishy flavors in oxidizing oils. Rather, it is shown that these phenomena probably occur together in each case. Thus in fish oil, the fishy flavor may be due to chemical changes involving both straight oxidation of the fatty acids in fish oil, but also changes in small traces of nitrogen, phosphorous, sulfur, or other components present in the oil may also play an important role. Work along this line from a general point of view is continuing at Seattle. Although Dr. Chipault began in 1959 some work on the possibility of some of these trace components of fish oils being involved in fishy odors in fish oils, it was felt that so many aspects were now involved in the mechanism of fishy flavor development, that additional effort was needed to prevent Dr. Chipault's research from being spread over too many aspects.

Research on Fishy Flavors: Accordingly, in 1960, a contract project was awarded for Dr. Mangold to investigate mechanisms for fishy odor and flavor development over and beyond straight oxidative deterioration. Dr. Mangold, previous to any contract work with the Bureau, had collaborated informally with Malins of the Seattle Laboratory in the adaptation of thin-layer chromatography to the analysis of fish oils. This research has been of tremendous importance not only to the fish oil program, but also to lipids chemistry in general. Before Mangold and Malins' research, thin-layer chromatography was an

almost unknown technique used in very few laboratories, and it had never been applied to lipids. Largely as a result of the efforts of Mangold and Malins, this new technique was adapted to the lipid field, and today this method is finding rapidly increasing use in hundreds of laboratories in this country and elsewhere throughout the world. For two papers, which Mangold and Malins presented on thin-layer chromatography before the American Oil Chemists' Society, they jointly received a year ago the Bond Award for the best paper on oil chemistry of the year. Thin-layer chromatography as adapted by Mangold and Malins to fish oils is becoming of great value to the fish oil program, especially with respect to monitoring reactions in preparing fish-oil derivatives. By applying this new technique, it is now possible to improve upon such reactions, some of which had previously been studied and had to be discarded because in the past the analytical methods had not been good enough to follow all of the reactions occurring.

When Dr. Mangold received his first contract from the Bureau on the fish oil program, the first problem was to have available rapid methods for separation and determining the various nitrogen, phosphorous, and sulfur compounds suspected of being partially responsible for fishy flavors and odors in menhaden oil. He, therefore, developed thin-layer chromatographic methods for analysis in fish oils of small traces of such compounds as mercaptans and amines. A paper describing these methods was published in 1962 (Mangold and Kammerer, *J. Am. Oil Chem. Soc.*, vol. 39, pp. 201-206.) The method is currently being used to analyze fish oils to determine whether any of these types of compounds are associated with fishy odors common in fish oils.

Another approach to fishy odors in fish oils is also being investigated by Dr. Mangold. It is known that fish oils can be completely deodorized and yet these will have reversion of the fishy odor or flavor. This return of a fishy odor or flavor sometimes occurs either in the absence of oxygen or when so little oxygen is present that some mechanism other than oxidation is suspected of being responsible. With some foods other than fish, a mechanism has very recently been proposed to account for similar behavior. It has been shown that some oils contain certain precursors of fishy or other off-flavors. These precursors are not just the triglycerides or fatty acids. Rather they

are a class of compounds related to plasma-logens, which have been termed "aldehydogenic compounds." These are labile compounds containing an ether linkage. They readily break down to aldehydes that possess fishy or similar flavors and odors. Dr. Mangold is currently looking into the possibility that such compounds may play a role in the mechanism of fishy flavor formation in menhaden oils.

Recent Work of Dr. Chipault: Since Dr. Mangold has been assigned to work in the area which Dr. Chipault had started to investigate on "fishiness" resulting from reactions other than mere oxidative rancidity, Dr. Chipault's current project deals with investigation of odoriferous and other compounds formed from relatively pure highly polyunsaturated fish-oil fatty acids such as the C22 hexenoic fatty acid. This phase of the work was started in mid-1962. It is felt that past work of Dr. Chipault carried out in the early stages of the program (1955-1959) has demonstrated that the situation during oxidation of fish oil triglycerides is too complicated for a reasonably small program to elucidate all the complex reactions. The present approach is being used because it is felt that the use of model systems with lesser numbers of reactants will enable the mechanism of fishy-rancid odor and flavor development to be much more quickly investigated. Some somewhat similar studies are also in progress at the Seattle Laboratory of the Bureau in a program unrelated to the fish oil program yet which involves oxidation of relatively pure fish oil polyunsaturated fatty acids. This research, which is financed by the Atomic Energy Commission, may eventually be of aid in accelerating results on the program on fishy odors in fish oils as currently being studied by Dr. Chipault.

Inter-relationship Between Program of Contractors at Hormel Institute and Other Research at Seattle Laboratory: Several programs as listed below are being carried out at the Bureau Laboratory at Seattle, most of which are not directly a part of the fish oil program, yet which are giving results that are furthering the efforts of the contract research on fishy odors and flavors being carried out at Hormel Institute. These programs are as follows:

<u>Program</u> Compounds Forming in Spoiling Fish Nature of Compounds Responsible for Fishy Odors Effect of Irradiation on Fish Oil Fatty Acids
--

<u>Investigator</u> Dr. Groninger M. E. Stansby Dr. Stout
--

Furnishing Palatable Fish Oil for Research at
Other Institutions
Stability of Fish Oil and Derivatives

Gauglitz
Houle

It has been found throughout the contract investigations on fishy odors and flavors that it is highly desirable to maintain the closest liaison among the various projects concerned with this work. The biggest problem from this standpoint is the definitions of vocabulary terms describing various odors and flavors. Such subjective words as musty, stale, sweet, etc. mean different things to different people. For example, at Seattle Dr. Groninger was using "stale" to denote the same odor as Dr. Chipault at Hormel Institute had termed "fishy." On one occasion Dr. Chipault ran into a new type of odor which he tried to describe in words but which meant nothing to other investigators. Later it developed this was an odor which had been known at the Seattle Laboratory for many years and had always been described as "sweet."

In order, so far as possible, to eliminate these difficulties, a series of workshop sessions has been held between personnel of the Seattle Laboratory and those of the Hormel Institute. For example, two such sessions were held last year, one at Seattle attended by Hormel Institute personnel and one at Hormel Institute attended by Stansby. At the latter session, Stansby took back dozens of samples of fishery products having many different odors and flavors. These samples were examined and terminology discussed. A similar session was scheduled during September 1962 in Seattle.

There are other ways in which cooperation among these various programs is very helpful. An example of this concerns the Seattle production with the large-scale molecular still of gallon quantities of palatable fish oil for research by outside agencies. In the course of this work, concentrates of "fishy" odors and flavors are removed during the refining steps. These are often sent to Dr. Chipault and/or Dr. Mangold as sources of compounds for their research into the chemistry of fishy odors and flavors. Also, some of the purified oils may still retain different types of fishy flavors and sometimes portions of these oils are sent for research at the Hormel Institute.



Fish Farming

FISH CROP FROM FLOODED RICE LANDS:

Ways to improve the production of fish on flooded rice lands are being studied at the new Fish Farming Experimental Station at Stuttgart, Arkansas, by the U. S. Bureau of Sport Fisheries and Wildlife. All completed experimental ponds at the new station had been filled with either surface or ground water and stocked with fish by June 1962.

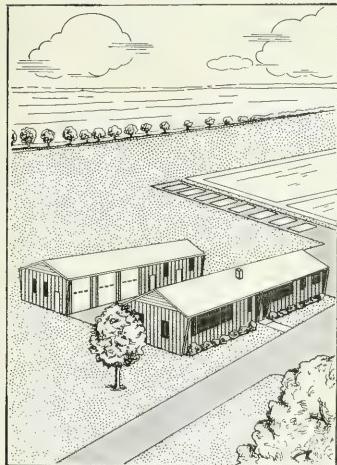


Fig. 1 - Sketch of the Fish Farming Experimental Station, Stuttgart, Arkansas.

Some of the ponds were fertilized to encourage a growth of algae. The amount of fish harvested from any area is directly related to its fertility. Basic units in the con-

version of inorganic elements to proteins and carbohydrates are the tiny microscopic plants known as algae. With the aid of energy from the sun, these tiny organisms form the initial food particles which will ultimately end in a food fish. Tiny animals known as zooplankton feed on the algae. These are, in turn, consumed by small fish of nearly all species. Small fish are then pursued by predators which will eventually provide food for man. Such a cycle is known as a Food Chain.

If the proper inorganic elements are lacking in a pond, few, if any, of the needed plants can grow and the pond is said to be infertile. In such cases commercial fertilizers are often added to encourage a "bloom" or growth of algae. Precautions must be taken to avoid over-fertilization lest an excessive bloom occur and cause an oxygen depletion on a hot, cloudy day.

All species of fish are dependent upon zooplankton during their early life stages. In stocking a properly fertilized pond or reservoir, fishery biologists recommend using a variety of species which will use all of the available food with a minimum of competition among the species. Variations such as bluegill-bass; catfish-minnows; or catfish-buffalo-fish-bass are desirable combinations. Carp may be added to these combinations to control excess vegetation. It is possible, however, to raise only a single species in a pond or reservoir.

The ponds at the Experimental Station at Stuttgart were stocked with different combinations of species at varying rates. The Marion National Fish Hatchery supplied

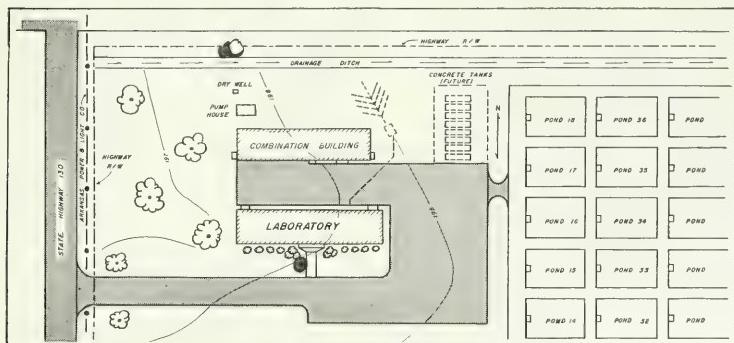


Fig. 2 - Diagram showing arrangement of the Station.

40,000 channel catfish and 12,000 crappies; the Corning National Fish Hatchery furnished 10,000 fingerling bass; and the Arkansas State hatchery at Lonoke, Arkansas, provided large-mouth buffalofish, fathead minnows, and Israeli carp. Two flathead catfish had been spawned successfully at the station by June 1962.

Field studies are being made at the Station to (1) determine the species of fish best suited for culture; (2) find methods for efficiently spawning fish and producing fingerlings for stocking purposes; (3) develop economical methods for raising desirable fish to a useful size; (4) develop controls for undesirable species of fish; (5) develop suitable methods for harvesting fish; (6) develop controls for aquatic weeds; and (7) determine, in cooperation with the Department of Agriculture and the Rice Branch Experiment Station, the effects of fish-rice rotations on soil fertility.

Laboratory research includes studies on (1) parasites and diseases affecting fish raised in reservoirs and the development of control measures; (2) the effect of environmental changes on the physiology of fish; (3) the effects of agricultural chemicals on fish survival; (4) the nutritional requirements of fish; (5) improvement of strains of fish through selective breeding and mutation; and (6) improved techniques for spawning fish through the use of hormones and manipulation of the water quality.

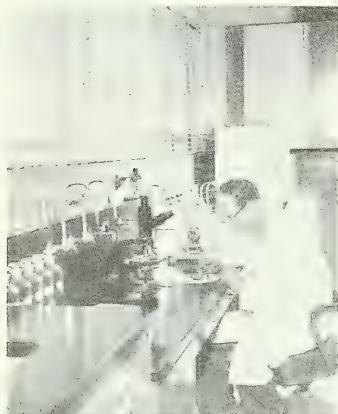


Fig. 3 - Biologist examining specimens in the laboratory at Stuttgart.

Research facilities are provided with both surface and ground water, and with air, gas, and electrical outlets. Office-laboratories for the research staff are equipped with the latest in scientific equipment.



Fish Protein Concentrate

BAKERY PRODUCTS WITH CONCENTRATE SAMPLED BY TASTE PANEL:

During a recent palatability test in Seattle, Wash., only 8 men of a group of 33 were able to guess correctly which products contained fish protein concentrate. All of the men in the group were associated with the fishing industry. A U. S. Bureau of Commercial Fisheries home economist served the group butter cookies and bran muffins with and without fish flour. Each person rated the products on palatability score sheets. Out of a possible perfect score of 100 percent, the products scored as follows:

<u>BUTTER COOKIES</u>	
Sample A with fish protein concentrate	90.58 percent
Sample B without fish protein concentrate	88.52 "
<u>BRAN MUFFINS</u>	
Sample A with fish protein concentrate	89.06 percent
Sample B without fish protein concentrate	88.43 "



Florida

NEW FISH BEHAVIOR LABORATORY:

Construction of a fish behavior laboratory at the University of Miami is expected to begin this year, according to the Director of the University's Institute of Marine Science. Grants totaling \$300,000 have been received for the new laboratory, which will cost \$470,000. The International Oceanographic Foundation is trying to raise the remaining \$170,000 from interested fishermen.

This will be the first laboratory designed specifically for investigations of the behavior of living salt-water fish. Fourteen thousand square feet of research area will be equipped with the latest apparatus for studying the activities and responses of all kinds of marine life. Every laboratory room will have clear, running sea water with accurate temperature control. There also will be instruments for precise control of water sound, light, and chemical action.

Utilizing this new Controlled Environments Building, scientists will be able to duplicate sea conditions or even to create a new environment for animals under study, using complex instruments to record their reactions. The building's design permits living specimens to be transferred from the sea to tanks with maximum safety. Special pressurized tubular tanks up to 40 feet in length will enable investigators to study extremely large fish under simulated conditions of great depth. Water in the tanks will be regulated for temperature, salinity, oxygen, carbon dioxide, acid-base relationship, and cloudiness. Filtered rooftop settling tanks will provide up to 600 gallons of water a minute.

Complex electronic equipment will record and measure the nervous reactions of fish to various stimuli. In addition, there will be facilities for studying responses to the earth's magnetic field; rooms shielded from magnetic attraction, outside sound and light; and at least one laboratory equipped with a Faraday cage to screen out outside interference while minute electrical impulses from nerves and muscle tissue are recorded.

The new laboratory will help find answers to many questions that have plagued fishermen and marine scientists alike: How and why do fish migrate? What system of biological navigation do they have? Why do they feed only at certain times? Why do they prefer different types of bait on different occasions? In short--what goes on in the mind of a fish?

Emphasis will be placed on "pure" science investigations such as studies of porpoise communication by sonar and the current research of the Institute on shark hearing systems, but the practical byproducts of such a facility should be of value to fishermen. From its research projects may come new and effective forms of shark control, improved baits and lures, new data on the feeding habits and times of game fish, and accurate charting of the migrations of school fish.

Note: See Commercial Fisheries Review, July 1962 p. 17 and May 1962 p. 19.



Great Lakes

LAKE TROUT PLANTED IN LAKE MICHIGAN FROM FERRY:

Experimental plantings of lake trout from the National Fish Hatchery, Charlevoix, Mich., were made during the early summer of 1962 in Lake Michigan, directly from the Chesapeake and Ohio Ferry as it passed over the Milwaukee Reef. Nearly 73,000 lake trout weighing more than 3,800 pounds, were successfully planted in that way. Personnel and equipment from the State of Michigan's Department of Conservation assisted in the operation.

* * * * *

OUTLOOK PROMISING FOR TRAWLING IN LAKE MICHIGAN:

The future looks promising for trawl fishing in Lake Michigan with the start of the 1962 summer fishing season. In June, State of Michigan-licensed commercial fishermen had firm orders for all the chubs they could catch, plus a fair amount of alewives.

A freezer with a 2-million-pound capacity is being built at the dock in Saugatuck, Mich. Ice machines, forklift, and other equipment were ordered, and the facility was expected to be in operation by late June or early July. The equipment and docking facilities are being financed by a Saugatuck construction company which has confidence in the future of the fish business in Lake Michigan.

Details of the sea lamprey and lake trout programs for Lake Michigan were discussed by U. S. Bureau of Commercial Fisheries personnel at a meeting in Milwaukee on June 15, 1962. The meeting was attended by members of the United States section of the Great Lakes Fishery Commission to discuss problems concerning the budgets and program of the Commission.

* * * * *

ORGANOLEPTIC EVALUATION OF FRESH-WATER HERRING:

Because of increased interest by the Lake Superior fishing industry to better utilize lake herring from that Lake, the U. S. Bureau of Commercial Fisheries technological laboratory at Ann Arbor, Mich., has been making an organoleptic evaluation of herring products. About early summer, various lake herring products were placed in cold-storage at 0° F.

to obtain preliminary information as to the effects of processing variables on their quality.

Fillets, headed and gutted, and whole herring, with no glaze, an ice glaze, or an alginate glaze were individually heat-sealed in cellophane pouches. Breaded herring fillets were also put up, replacing the conventional egg batter in one lot with a thin alginate dip before applying the breading. The samples are being held at 0° F. and are scheduled for periodic organoleptic examinations, following final processing (to a breaded fillet and deep-fat frying).

A one-month examination of the various herring fillet products in storage was conducted early in July 1962. The one-month examination did not reveal any marked differences between lots of fillets or with the control, although the products treated with alginate received slightly fewer deduction points for flavor and texture defects. The examinations are to be continued at regular intervals.



Great Lakes Fishery Investigations

WESTERN LAKE SUPERIOR FISHERY SURVEY CONTINUED:

M/V "Siscowet" Cruise 2 (June 4-14, 1962): Spring environmental conditions were studied at three limnological stations in the Apostle Islands region--southeast of Stockton Island, northeast of Bear Island, and in Pike's Bay. Routine limnological collections included records of water temperatures, Secchi-disc readings, water samples for chemical analyses, and bottom and plankton samples. The water temperature did not change during the early part of the cruise, but by mid-June surface water temperatures in some areas had reached 55° F. Secchi-disc readings ranged from 10 feet in Pike's Bay to 25 feet northeast of Bear Island. Plankton abundance was relatively low at all stations.

Studies were continued on the distribution and abundance of native and hatchery-reared lake trout in the Apostle Islands area. Most of the lake trout caught in that area were from the 15- to 25-fathom depth range.

With the completion of Cruise 2, the Siscowet in 1962 had captured 497 small lake

trout, of which 477 (96 percent) were fin-clipped. Of the recaptured hatchery-reared fish planted before 1962, a total of 252 (64 percent) were from the 1961 Bayfield shore plant, 115 (29 percent) were from the 1960 shore plant, and 22 (6 percent) were from the 1959 boat plant. Those returns support evidence obtained during the 1961 season that the success of the 1960 plant was excellent, and that results from the 1959 plant were poor. The first-year survival of the 1961 plant appeared to be excellent.

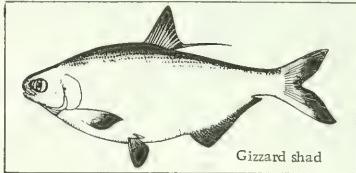
Trawling with the Siscowet during, and immediately after the release of approximately 20,000 lake trout from shore, confirmed observations made in 1961 that the fish reach suitable trout habitat (15 fathoms, 1 mile from shore) in 3½ to 4 hours after planting.

Note: See Commercial Fisheries Review, Aug. 1962 p. 18.

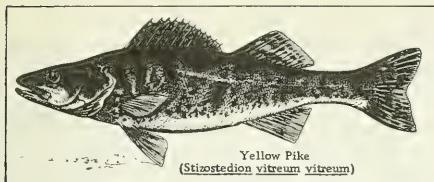
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LAKE ERIE FISH POPULATION SURVEY CONTINUED:

M/V "Musky II" and M/V "Madtom" (July 1962): Vessel operations in July were mainly exploratory, and to ascertain the relative abundance and distribution of young-of-the-year fish. The Musky II made 35 offshore trawl tows, mostly in the Sandusky and Islands regions. The Madtom, a 16-foot outboard craft, made 55 tows at depths of 4 to 15 feet in selected areas along the south shore, between Monroe, Mich., and Barcelona, N. Y. Numerous fish collections were preserved and measurements recorded for later analysis.



In the western basin, the 1962 hatch and survival appeared to have been exceptionally good for yellow pike, yellow perch, white bass, alewives, gizzard shad, and spot-tail shiners. Collections later in the season will be necessary to fully evaluate the spawning success of channel catfish, sheepshead, emerald shiners, and smelt. In general, however, a good year was indicated for most species.



Young-of-the-year (yellow pike) and yellow perch were uniformly distributed throughout the western basin. Approximately 700 yellow pike were caught during July alone, which far exceeded the number of fingerlings taken in any previous year. A single 10-minute tow yielded an estimated 70,000 young yellow perch, and many other tows yielded 5,000 to 10,000 of that species. Collectively, the tows averaged about three times as many young yellow perch as were caught in 1959—the year in which the largest previous year-class on record was produced. Yellow perch (and the young of most other species) were caught at depths of 5 to 10 feet. Yellow pike were most numerous at depths of 10 to 12 feet.

In contrast to the abundance of small fish in the western basin, trawling with the Madtom for 3 days along the south shore of the central and eastern basins revealed only limited numbers of young fish. The fish were considerably smaller than in the western basin, probably because of the later hatching period and cooler water temperatures. Large numbers of yellow perch were observed in the harbor at Erie, Pa. No young yellow pike were caught east of Vermilion, Ohio.

In the western basin, the growth of the young of all species appeared to be generally comparable to growth in other years. By the end of July, yellow pike were averaging 5 inches in length; yellow perch, $2\frac{1}{2}$ inches; and white bass, 2 inches.

The Musky II made biweekly visits to two stations in the central basin as part of a continuing study of oxygen deficiencies at the lower depths. Dissolved oxygen determinations and depth casts were made at 5-mile intervals. Oxygen deficiencies were noted in only a few of the many water samples taken, which was in contrast to 1961 when depletion was extensive in July of that year.

Surface water temperatures averaged about 75° F. in the western sector of the

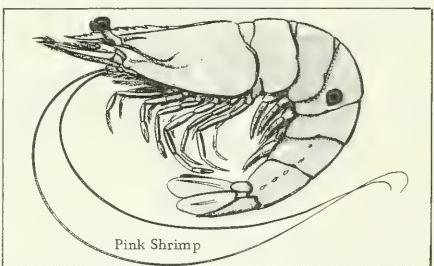
lake and 70° F. in the central and eastern basins, and fluctuated little during the month. Note: See Commercial Fisheries Review, Aug. 1962 p. 21.



Gulf Exploratory Fishery Program

BURROWING BEHAVIOR OF PINK SHRIMP STUDIED:

M/V "George M. Bowers" Cruise 37 (April 19-21 and 25-28, 1962), 38 (May 10-15), 39 (June 12-28): Field experiments on the behavior phase of the shrimp gear research project in the Gulf of Mexico were the objectives of these cruises by the U. S. Bureau of Commercial Fisheries research vessel George M. Bowers. Cruises 37 and 38 were conducted in Mississippi Sound where conditions were unfavorable for behavior studies. Conditions for this work were excellent in St. Andrews Bay, Fla. (Panama City) during cruise 39, and the initial phase of the study was completed there.



Experiments were conducted to determine the burrowing behavior of pink shrimp so as to gain a better understanding of the effect of such behavior on the efficiency of commercial fishing gear. The initial objectives were to measure the extent and duration of bottom penetration by the various commercial species, and the effect of artificial stimulation on the animal while in the burrowed state. Observations were made using SCUBA gear to eliminate all but essential artificial environmental effects.

The following data were obtained from these observations and measurements:

1. The manner by which pink shrimp burrow into the bottom using their various appendages.

2. Burrow depths ranged from $\frac{3}{4}$ to 2 inches.

3. Pink shrimp burrow to just below the surface of the substrate, and are very difficult to detect visually.

4. Mechanical stimulation (probes, chain drags, and water jets) to the dorsal body surface cause the burrowed animal to immediately withdraw deeper into the bottom sediment.

5. Artificially-induced sediment clouds above burrowed shrimp caused about half of the individuals to emerge from the bottom.

6. Observed pink shrimp remained burrowed from $13\frac{1}{2}$ to 23 hours. Activity above the bottom seemed to be restricted.

7. Shrimp generally emerged from the bottom between 7 p.m. and 7:30 p.m. and were burrowed again by 9 p.m. A few individuals would usually remain unbBurrowed and on the bottom for most of the night.

Shrimp behavior experiments are to be continued through the summer in St. Andrews Bay.

Note: See Commercial Fisheries Review, Jan. 1962 p. 20.



Gulf Fishery Investigations

BETTER SHRIMP CATCHES FORECAST FOR 1962:

A significant upward trend in the shrimp harvest from northern Gulf of Mexico waters during the last half of 1962 is indicated by findings of shrimp studies conducted by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex. This prediction is based on an analysis of comparable measures of abundance obtained for young brown shrimp in the Galveston area over the past three years.

Although the brown shrimp reproduces offshore in almost all seasons, the greatest spawning activity takes place during the period late January to early March. The resulting masses of larvae arrive at the barrier island passes and begin to enter inshore "nursery" areas roughly 4 to 5 weeks after spawning and hatching. Some 6 to 7 weeks later they reach a size suitable for sport fishing bait, and soon thereafter migrate

back to the open Gulf where they are normally caught in good quantity by the commercial fishing fleet during July to September.

By means of carefully executed sampling techniques, Bureau biologists measure the size of the brown shrimp's "spring run" at two distinct stages in its early development. The first measure, or index, is obtained as the shrimp pass through Galveston Bay entrance. At that stage they are very densely concentrated, average only about 5/8 of an inch in length, and are called postlarvae. The second index is obtained from statistics of the commercial bait shrimp fishery which operates throughout the Galveston Bay system, one of the more important nursery areas on the upper Gulf coast. Referred to as juveniles or "bait," the shrimp at that stage range from 2 to 4 inches long, but are not so crowded or numerous as when they were sampled at the Bay entrance six weeks earlier. Commercial size is reached at a length of approximately 5 inches and shortly after the shrimp return to the ocean.

Month	Indexes of Abundance for Postlarval, Juvenile, and Adult Brown Shrimp, East Texas Gulf Coast, 1960-1962								
	Postlarvae 1/ 1962	Postlarvae 1/ 1961	Postlarvae 1/ 1960	Juveniles 2/ 1962	Juveniles 2/ 1961	Juveniles 2/ 1960	Adults 3/ 1962	Adults 3/ 1961	Adults 3/ 1960
Jan.	27	-	3	-	-	0.3	-	0.33	0.43
Feb.	231	1	2	-	-	0.3	-	0.29	0.38
Mar.	5/306	23	615	-	-	0.2	-	0.21	0.45
April	280	35	554	-	-	0.4	-	0.29	0.23
May	32	25	16	30.4	18.3	29.9	-	0.24	0.31
June	-	-	4/	-	37.1	105.9	-	0.27	0.27
July	-	-	-	-	19.3	27.2	-	0.56	1.43
Aug.	-	16	-	-	11.1	17.4	-	0.48	0.91
Sept.	-	170	3	-	2.1	2.1	-	0.39	0.61
Oct.	-	27	1	-	1.0	3.3	-	0.16	0.49
Nov.	-	3	1	-	1.0	0.9	-	0.09	0.42
Dec.	-	5	1	-	-	-	-	0.15	0.38

1/Average number of postlarvae in "standard," semiweekly samples taken in Galveston Bay entrance; postlarvae range in length from 10-15 millimeters (about 5/8 inch).

2/Average catch of juvenile shrimp (in pounds) per hour's trawling throughout the Galveston Bay system; trawls average about 15 ft. in width and have a mesh of 1-1/2 in.; juvenile shrimp range in length from 40-100 millimeters (1-1/2 - 4 inches); data are obtained from the commercial bait-shrimp fishery which operates continuously.

3/Average catch of commercial-size shrimp (in 1,000 pounds heads-off) per 24 hours' trawling off the Texas coast; adult shrimp range in length from 110-200 millimeters (4-1/2 - 7-1/2 inches; data from offshore commercial fishery.

4/Sample catches not separated by species during June-August. Includes two samples taken in San Luis Pass at the western end of Galveston Island.

Observations in 1960 and 1961 revealed a very strong correlation between the post-larval and juvenile indexes, and, in each year, the subsequent production of commercial-size shrimp. The possibility that these indexes could be used to economic advantage

in predicting shrimp production during the last half of each calendar year became at once apparent. The fact that the second, or juvenile index, serves to substantiate what is suggested by the first or postlarval index, greatly strengthens the method's usefulness as a prediction device.

In 1960, a high postlarval index in early April was succeeded in May-June by a high juvenile index and record high bait-shrimp production. Both indexes forecast a great abundance of shrimp offshore in late summer. As it turned out, 1960 proved to be a record year for brown shrimp production in western Gulf waters. In 1961, the postlarval index dropped to only a fraction of its 1960 level, while the corresponding juvenile index was reduced by two-thirds. Although the production of bait shrimp in Galveston Bay fell only slightly, bait fishermen had to work up to three times harder to catch the amount needed to meet the demand. The subsequent decline in the 1961 commercial shrimp production offshore, as is now well known, brought dire results to the domestic shrimp fishing industry.

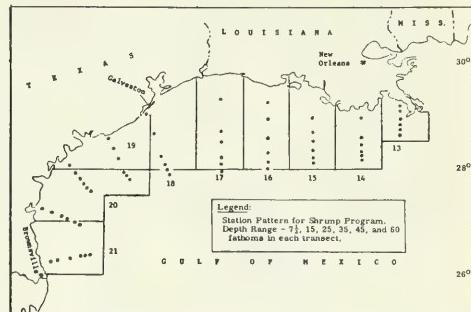
Signs of recovery in 1962 are indicated in a postlarval index for the period February-April which approaches that for the corresponding period in 1960, and by a juvenile index for May of this year which exceeds that of the same month in 1960. Bait shrimp production during May 1962 was also the highest ever recorded for that month. On the basis of these observations, as well as supporting observations made and reported by fishermen and other interested persons, the Bureau predicts good to excellent catches for the shrimp fleet fishing the waters off Louisiana, Texas, and areas off northern Mexico during July-October 1962. Over-all shrimp landings in 1962 should measurably exceed those of 1961, though not necessarily equal those of 1960.

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SHRIMP DISTRIBUTION STUDIES:

M/V "Belle of Texas" Cruise BT-23 (July 18-24, 1962): Moderate catches of 12-15 count and 26-30 count brown shrimp were made off the Texas coast by the research vessel Belle of Texas. The vessel is operated by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries in studying the distribution of shrimp in the Gulf of Mexico.

Four statistical areas were covered. One 3-hour tow was made in each of 3 depth ranges in each area. A 45-foot shrimp trawl was used. Most of the catches consisted of brown shrimp with traces of white and pink shrimp. Large numbers of small brown shrimp counting over 68 to the pound were found at $7\frac{1}{2}$ fathoms in areas 20 and 21.



Shows the station pattern for cruise BT-23 of the M/V Belle of Texas (July 18-24, 1962).

The largest single catch was 50 pounds of over 68 count brown shrimp in the depth range up to 20 fathoms in area 21. The same area yielded 26 pounds of 12-15 count shrimp in the 20-40 fathom depth range, and 8 pounds of less than 12 count shrimp in the 40-60 fathom depth range.

Area 20 yielded 31 pounds of over 68 count brown shrimp in the up to 20 fathom depth range; 10 pounds of 15-20 count shrimp in the 20-40 fathom range; and 7 pounds of 12-15 count shrimp in the 40-60 fathom range.

A catch of 23 pounds of 26-30 count brown shrimp was made in the up to 20 fathom depth range in area 18. Catches were light in other depth ranges in area 18 and in all depth ranges in area 19.

Note: (1) Shrimp catches are heads-on weight; shrimp sizes per pound are heads-off basis.

(2) See Commercial Fisheries Review, Aug. 1962 pp. 22-23.



Indian Fishing

LAW ENFORCEMENT CONFERENCE ON INDIAN FISHING:

Indian fishing activities on the Columbia River was the subject of a law enforcement

conference in Portland, Oreg., on July 20, 1962. Officials of Washington and Oregon, United States Attorneys involved with Columbia River fishing problems, and representatives of the U. S. Bureau of Indian Affairs, and other Federal agencies attended.

The assistant Director of the Oregon Fish Commission said the meeting was called to develop uniform procedures of enforcement and prosecution in cases in which Indian fishing conflicts with State fishery conservation laws. In opening the meeting, the Assistant Director stated that while the Fish Commission has never taken the position that Indians should be deprived of the right to take fish, the agency is concerned with achieving a suitable degree of regulations that will assure perpetuation of Columbia River stocks. Unrestricted fishing will ruin the Columbia runs, he said.



Industrial Products

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-June 1962: Based on domestic production and imports, the United States available supply of fish meal for the first 6 months of 1962 was 44,933 tons or 21.4 percent greater than during the same period of 1961. Domestic production was 11,873 tons or 11.6 percent higher, and imports were 33,060 tons or 30.7 percent greater than in the 6 months period of 1961. Peru continued to lead other countries with shipments of 106,377 tons during the first 6 months of 1962—32,366 tons above the imports in the same period of 1961.



Bagging menhaden scrap meal in a reduction plant in Empire, La.

Item	U. S. Supply of Fish Meal and Solubles, January-June 1961-62 and Total for 1961		
	January-June 1/1962	1961	Total 1961
.....(Short Tons).....			
<u>Fish Meal and Scrap:</u>			
<u>Domestic production:</u>			
Menhaden	98,538	88,900	247,551
Tuna and mackerel	9,068	9,705	21,243
Herring	826	1,258	5,268
Other	10,043	7,639	37,203
Total production	114,875	102,502	311,265
<u>Imports:</u>			
Canada	23,242	19,367	38,218
Peru	106,377	74,011	151,439
Chile	3,682	5,892	12,074
Angola	-	1,433	1,543
So. Africa Republic	7,184	6,936	13,026
Other Countries	401	727	1,545
Total imports	140,886	107,826	217,845
Available fish meal supply ..	255,261	210,328	529,110
<u>Fish Solubles:</u>			
<u>Domestic production 2/</u>	49,277	40,200	112,241
<u>Imports:</u>			
Canada	951	660	1,001
So. Africa Republic	538	307	1,851
Other Countries	2,801	252	4,387
Total imports	4,290	1,219	6,739
Available fish solubles supply ..	53,567	41,419	118,980
1/Preliminary. 2/50-percent solids. Includes production of homogenized condensed fish.			

The total United States supply of fish meal in calendar year 1961 of 529,100 tons exceeded the peak year 1959 when the quantity amounted to almost 440,000 tons.

The United States supply of fish solubles (including homogenized fish) during January-June 1962 was 12,148 tons more than during the same period in 1961. Solubles and homogenized fish of 49,277 tons manufactured from domestically-caught fish made up 92 percent of the 6-months supply in 1962.

* * * * *

U. S. FISH MEAL, OIL, AND SOLUBLES:

Production, June 1962: During June 1962, 58,400 tons of fish meal and scrap and 6.9 million gallons of marine animal oils were produced in the United States. Compared with June 1961, this was an increase of 7 percent in meal and scrap production and 4 percent in oil.

In June menhaden accounted for 53,000 tons or 91 percent of the meal total, and

Table 1 - U.S. Production of Fish Meal, Oil, and Solubles, June 1962 with Comparisons

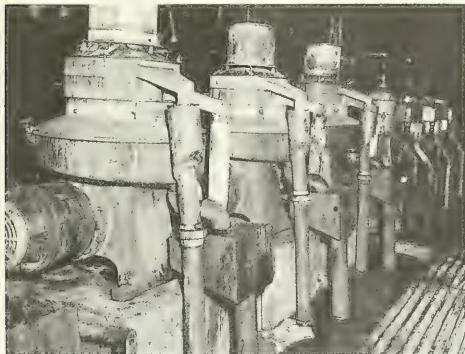
Product	June		Jan.-June		Total
	1/1962	1961	1/1962	1961	
(Short Tons)					
<u>Fish Meal and Scrap:</u>					
Herring	640	1,258	826	1,258	5,268
Menhaden 2/	52,994	49,646	93,538	83,900	247,551
Sardine, Pacific			689		2,518
Tuna and mackerel	2/1,837	1,169	9,968	9,705	21,243
Unclassified	2,926	2,326	9,354	7,639	14,757
Total	58,997	54,399	114,375	102,502	291,337
Shellfish, marine animal meal and scrap . . .	3/	3/	3/	3/	19,928
Grand total meal and scrap	3/	3/	3/	3/	311,265
<u>Fish solubles</u>	21,180	16,110	42,412	36,552	100,551
Homogenized condensed fish	3,170	1,662	6,865	3,648	11,690
(Gallons)					
<u>Oil, body:</u>					
Herring	107,200	185,320	114,200	216,930	818,017
Menhaden 2/	6,572,322	6,231,424	11,073,892	11,047,461	31,355,570
Sardine, Pacific			19,111		86,167
Tuna and mackerel	55,965	43,057	261,883	227,217	762,509
Other (including whale)	176,190	163,682	564,142	374,487	1,386,542
Total oil	6,911,677	6,623,483	12,032,728	11,866,095	34,408,805

1/Preliminary data. 2/Includes a small quantity produced from thread herring. 3/Not available on a monthly basis.

6.6 million gallons or 95 percent of the oil production.

There were 21,200 tons of fish solubles produced in June 1962--5,100 tons above the same month of 1961. The production of homogenized condensed fish amounted to 3,200 tons--about 1,500 tons more than in June 1961.

During the first half of 1962, meal and scrap production amounted to 114,400 tons--



In menhaden reduction plants large centrifuges are used to separate most of the oil from the press liquor, obtained when the cooked fish are pressed.

11,900 tons above the same period of 1961. The marine animal oil yield totaled 12 million gallons--a gain of 166,600 gallons.

* * * * *

Production, July 1962: Preliminary data on U. S. production of fish meal, oil, and solubles for July 1962 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

U. S. Production ¹ of Fish Meal, Oil, and Solubles, July 1962 (Preliminary) with Comparisons				
Area	Meal	Oil	Solubles	Homogenized
	Short Tons	1,000 Gallons	.. (Short Tons) ..	
July 1962:				
East & Gulf Coasts . . .	55,105	6,191	21,244	3/1,200
West Coast ²	3,091	292	172	-
Total	58,196	6,483	21,416	1,200
Jan.-July 1962 Total	170,645	17,794	64,903	6,570
Jan.-July 1961 Total	165,937	19,497	56,894	5,895

1/Does not include crab meal, shrimp meal, and liver oils.

2/Includes Hawaii, American Samoa, and Puerto Rico.

3/Includes condensed fish.

* * * * *

Major Indicators for U. S. Supply, July 1962: For the first seven months of 1962, fish meal and solubles production was considerably higher than in the same period of 1961. Fish oil production showed a decrease of 1.5 percent.

Major Indicators for U. S. Supply of Fish Meal, Solubles, and Oils, July 1962					
Item and Period	1962	1961	1960	1959	1958
Fish Meal:	(Short Tons).....				
Production 1/:					
September	-	28,642	36,239	36,874	33,185
August	-	57,031	49,709	47,364	40,783
July	58,200	62,586	55,696	52,132	43,467
Jan.-June	114,375	99,819	74,024	91,473	60,043
Jan.-Dec. prelim. totals 2/.....	-	289,039	257,969	275,396	216,510
Jan.-Dec. final tot.	-	311,265	290,137	306,551	248,140
Imports:					
September	-	13,941	9,487	9,224	5,079
August	-	19,026	8,340	5,695	5,310
July	-	18,710	13,131	4,303	13,546
June	26,453	19,317	11,178	10,836	9,091
Jan.-May	114,433	88,509	55,197	90,585	46,855
Jan.-Dec.	-	217,845	131,561	132,925	100,352
Fish Solubles:					
Production 3/:					
September	-	11,232	12,573	23,979	22,301
August	-	19,685	16,921	29,785	24,653
July	22,600	22,589	18,876	30,163	24,995
Jan.-June	49,277	40,200	36,946	58,888	33,421
Jan.-Dec. totals	-	112,241	98,929	165,359	130,177
Imports:					
September	-	263	38	1,732	253
August	-	318	180	4,718	2,819
July	-	708	96	4,938	607
June	-	872	207	149	202
Jan.-May	3,418	1,012	2,369	8,871	2,156
Jan.-Dec. totals	-	6,739	3,174	26,630	14,567
Fish Oils:	(1,000 Gallons)				
Production:					
September	-	3,224	3,939	4,353	3,689
August	-	6,548	4,910	3,877	4,106
July	6,500	7,553	5,337	4,143	3,791
Jan.-June 4/.....	12,033	11,264	6,877	8,010	3,812
Jan.-Dec. prelim. totals	-	33,471	26,690	24,418	21,625
Jan.-Dec. final tot.	-	34,416	27,886	24,978	22,028
Exports:					
September	-	1,269	1,861	1,129	665
August	-	1,774	186	2,449	752
July	-	589	5,414	3,770	791
June	-	656	2,805	2,084	1,514
Jan.-May	7,745	6,279	4,959	5,067	4,078
Jan.-Dec. totals	-	16,331	19,154	19,264	12,539

1/ Does not include crab meat, shrimp and muss. meals.

2/ Preliminary data computed from monthly data. Fish meal production reported currently comprised 86 percent of the annual total for 1958, 90 percent for 1959, 89 percent for 1960, and 87 percent for 1961.

3/ Includes homogenized fish.

4/ Preliminary data computed from monthly data. Represents over 95 percent of the total production.

Note: Data for 1962 and 1961 are preliminary.



Inventions

PRECOOKED FROZEN "LOX AND ONIONS":

A method that will allow smoked salmon, onions, and shortening to be combined and prepared as a precooked frozen food product has been issued a patent. The inventor claims that his new product can be repeatedly thawed and refrozen without loss of flavor, natural juices and taste characteristics, and without change in appearance from a freshly-prepared product. The inventor points out that the housewife thaws what she needs, mixes it with eggs to make an omelet, and returns the remainder to the freezer or refrigerator. By adding cream cheese or other ingredients, the patented recipe may also be used as a sandwich spread or dip. (Patent Number 3,012,896, U. S. Patent Office Classification Number 99-193, granted December 12, 1961, to Moe Phillip Katz, 2085 Farm Road, Alexandria, Va.)



Irradiation Preservation

NEW UNITED STATES ARMY RADIATION RESEARCH LABORATORY:

The first radiation facility specifically designed for food irradiation research was dedicated on June 28 at the Army Quartermaster Research and Engineering Research Center, Natick, Mass. The new U. S. Army Radiation Research Laboratory, the construction of which was completed in June 1962, is the world's largest military installation for the preservation of food by ionizing energy.

The new research laboratory is equipped with the largest known cobalt-60 source in the world (equivalent to more than one million grams of radium), a specially designed 24-million-electron-volt 18-kilowatt variable-linear accelerator, and supporting control and food-sampling preparation laboratories. The laboratory will be concerned primarily with research on radiation of foods for use by the military, but will also conduct studies on different types of foods for civilian use.

By perfecting irradiation techniques, the Army will be able to treat perishable food for storage without refrigeration. Equipment in the laboratory will permit precise control of radiation conditions to a hitherto unattainable high degree of accuracy.

The Army program is currently concentrating on sterilization of beef, pork, smoked ham, and chicken, as meat items of major logistical importance.

By agreement with the Department of Defense, the U. S. Atomic Energy Commission undertook the design and construction of the laboratory at Natick. Following general facility acceptance tests and training of Army operating personnel during the summer of 1962, the Army was to accept responsibility for the fully operational laboratory about September 1, 1962. The Laboratory was built at a cost of about \$1.8 million.



Maine Sardines

CANNED STOCKS, JULY 1, 1962:

Distributors' stocks of canned Maine sardines began to improve on July 1, 1962, after steadily declining for the previous 14 months. But stocks on hand of 134,000 actual cases on July 1, 1962, were still 36 percent below the 208,000 cases on hand on the same date in 1961, according to estimates made by the U. S. Bureau of the Census.



Canners' stocks on July 1, 1962, totaled 374,000 standard cases (100 3 3/4-oz. cans), an increase of 86 percent over the 201,000 cases on hand July 1, 1961. The Maine sardine pack during June 1962 amounted to 407,500 standard cases. Stocks held by canners on June 1, 1962, totaled only 50,000 cases.

The Maine Legislature authorized a 1962 season of 13 months--December 2, 1961-January 1, 1963. The 1962 season pack December 2-July 28 totaled 890,000 standard cases. The 1961 season was from April 15 to December 1, the usual legal packing season for canned sardines in Maine, and the pack April 15-July 28 was 179,000 cases. During the same period in 1960, the pack was 848,000 cases. On April 15, 1962, the date on which the packing season started in former years, carryover stocks amounted to 33,000 cases. One year earlier on April 15, 1961, carryover stocks totaled 457,000 cases.

The Maine Sardine Council in late July reported that fishing was good all along the Maine coast. But the small size of the fish had slowed down production--because packing costs go up sharply when small fish are handled.



Marketing

EDIBLE FISHERY PRODUCTS

MARKETING PROSPECTS, FALL 1962:

In the coming fall months, the United States per capita consumption of fishery products is expected to be slightly higher seasonally than during each of the first two quarters of 1962. Commercial landings of food fish and shellfish in August were at the season's peak, and the total for 1962 could be higher than in 1961. Landings of both shrimp and sardines were unusually light in 1961.

Retail prices, which were somewhat higher during the first half of 1962 than in the same period of 1961, are expected to drop slightly during the peak supply season, but will remain higher than a year earlier.

Supplies of fishery products in cold storage at midyear were about 13 percent lower than during the middle part of 1961. But there will be a gradual build-up in stocks of frozen

Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, July 1, 1962, With Comparisons ¹											
Type	Unit	1961/62 Season					1960/61 Season				
		7/1/62	6/1/62	4/1/62	1/1/62	11/1/61	7/1/61	6/1/61	4/1/61	1/1/61	11/1/60
Distributors .	1,000 actual cases	134	99	148	193	202	208	215	267	233	277
Canners . . .	1,000 std. cases ²	374	50	45	144	221	201	294	506	1,029	1,258

¹/Table represents marketing season from November 1-October 31.

²/100 3 3/4-oz. cans equal one standard case.



View looking south on South Street in the salt-water section of New York City's Fulton Fish Market.

fishery products and canned fish because of increased fishing and processing in the third quarter.

United States imports of most fishery products through the first half of 1962 were generally greater than a year earlier, and are expected to continue so for the remainder of this year.

Note: Prepared by the Bureau of Commercial Fisheries, Fish and Wildlife Service, U. S. Department of the Interior, and published in the Department of Agriculture's July 1962 issue of The National Food Situation (NFS-101).



Massachusetts

MARINE FISHERIES PROMOTION AND DEVELOPMENT LAW ENACTED:

A new Massachusetts marine fisheries law was signed (Chapter 715) by the Governor of Massachusetts on July 23, 1962, and became effective as of that date. The purpose of the new law, which was declared an emergency law, was to immediately bring about the orderly and coordinated activities of the Massachusetts marine fisheries and all activities relating thereto.

The law as amended provides for the following:

1. A Marine Fisheries Advisory Commission composed of 9 members within the Division of Marine Fisheries, such members to be appointed by the Governor with the approval

of the Council. Initially, 3 members of the Commission are to be appointed for terms of 3 years, another 3 members for terms of 2 years, and the other 3 members appointed for terms of 1 year. As the term of a member expires, his successor is to be appointed for a term of 3 years.

2. The Commission shall hold public hearings and make recommendations to the Director for the proper management and development of the marine fisheries of the Commonwealth of Massachusetts.

3. Additional funds for maintaining, managing, operating, and administering the Division of Marine Fisheries in carrying out its functions.

The new law is designed to help both the commercial and sports fisheries of Massachusetts, and is expected to result in expanded activities in the fields of fishery biology and statistics.



Oceanography

"WILLIAMSBURG" AS BIOLOGICAL RESEARCH SHIP FOR INDIAN OCEAN EXPEDITION:

Activation of the former Presidential yacht Williamsburg as a United States biological research vessel for the International Indian Ocean Expedition was announced on July 10. The National Science Foundation today announced award of a contract to the Woods Hole Oceanographic Institution for activation of the vessel.



Fig. 1 - The former presidential yacht Williamsburg is being reactivated as a United States biological research vessel and its name changed to Anton Bruun.



Fig. 2 - The former presidential yacht Williamsburg was transferred to the National Science Foundation of Washington on August 9 in brief ceremonies at the Philadelphia Naval Base.

Amount of the cost-plus-fixed-fee contract is \$500,000. Under the terms of the contract, the Institution will select the shipyard to accomplish the activation, subject to approval by the Foundation, and will supervise the work for the Foundation.

"The International Indian Ocean Expedition is a significant step forward in scientific cooperation," said the Foundation Director in making the announcement. "It represents not only the cooperative efforts of many countries, but cooperation among scientists of widely varying disciplines. Biologists as well as physical scientists will have a major share in the work. We are delighted that the Williamsburg is available as an important addition to their research capabilities."

Title to the ship remains with the United States Government, and she will be operated as a public vessel. Transfer of accountability from the Navy to the National Science Foundation, an independent agency of the Government, is now in process.

The Williamsburg early in July was in reserve status at the Philadelphia Naval Shipyard. She was to be towed to a private shipyard for activation, which is expected to take about 60 days from the date of her arrival in the yard.

Activation will include minor alterations necessary to make a research vessel capable of carrying 26 scientific personnel and 19 crew members. The former Presidential suite will be converted into laboratory areas. A wet lab will be installed below, where specimens will be received, bottled, and prepared for storing. A dry lab above will be equipped with microscopes and other instruments for preliminary examination and classification of specimens, and for such work as measurements of plankton density.

Two winches and a small crane will be installed for dredging and deep-sea work. In addition, a side deck platform will be constructed for fishing long lines.

Activation will also include bringing the engines to full operating condition, and installing larger bilge keels to enhance the ship's stability.

Following activation and a shakedown cruise, the Williamsburg is expected to begin her Indian Ocean cruise in early 1963. Present plans call for the ship to spend most of her two-year research cruise period in the western half of the Indian Ocean, although one track is planned in the Bay of Bengal on the eastern side of the Indian subcontinent. Her voyages will take her from the northern part of the Arabian Sea west of India down to the latitude of the Cape of Good Hope, crossing and recrossing the equator.

While participating in the International Indian Ocean Expedition, she will make port chiefly at Bombay, India, for resupply and to exchange personnel and specimens. Many biological specimens, particularly plankton, will be exchanged and sorted at the International center at Cochin, India.

Among the questions that biologists aboard Williamsburg will be seeking to answer are:

What organisms are found in the Indian Ocean--from microscopic plankton to large fish, oceanic mammals, and sea weeds?

What is the distribution, both seasonal and geographic, of these organisms, and what is their relative abundance?

What is the productivity of these organisms? --particularly organisms which if properly exploited could contribute greatly to the food needs of the peoples of the area.

The President announced on March 13, 1962, that he was making the Williamsburg available for participation in the International Indian Ocean Expedition, and assigned responsibility for conversion and assignment of the ship to the National Science Foundation.

The Williamsburg is 243 feet long and displaces 1,700 tons. Built in 1930 as the Aras, her name was changed during World War II when she became a Navy escort vessel. She was later converted to a Presidential yacht.

* * * * *

"WILLIAMSBURG" RENAMED "ANTON BRUUN" AND CONVERTED TO A RESEARCH VESSEL:

The former Presidential yacht Williamsburg will be renamed the Anton Bruun, the Director of the National Science Foundation announced on July 30, 1962. The ship was recently transferred to the Foundation for conversion to a research vessel for the International Indian Ocean Expedition.

"Anton Bruun was a noted marine biologist, associated with the University Zoological Museum of Copenhagen, and was first chairman of the International Oceanographic Commission, which is now sponsoring the Indian Ocean expedition," the Director said. "So it is most fitting that the ship be named after him."

The Director made the announcement during a talk at the NATO Advanced Study Institute on Algae and Man, held at the University of Louisville, Kentucky.



Oregon

ALBACORE TUNA STUDIES IN NORTH PACIFIC:

To study albacore tuna movements and to collect oceanographic data affecting tuna

movements off the Oregon coast were the objectives of the June 28-July 8 exploratory cruise by the Sandra Lee, a vessel chartered by the Oregon Fish Commission. The Commission has sponsored an annual exploratory cruise to study tuna for the last four years.

The Sandra Lee followed a zigzag course within an area 40 to 140 miles off the Oregon coast. The initial catch, consisting of 3 albacore tuna, was made at 8:30 a.m. July 5, about 115 miles west of Cape Sebastian. Water temperature in the area of the first catch was 59° F. Water temperature readings in other areas ranged between 58° and 60° F. Many forage fish and numerous birds were seen north of the area of the first catch. No commercial vessels were observed fishing for tuna in the area at the time of the first catch.

Last year the first tuna was caught on July 6, and 15 fish were taken during Oregon's 1961 exploratory tuna cruise.

Note: See Commercial Fisheries Review, August 1961 p. 34.

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CHINOOK SALMON TRUCKED AROUND COUGAR DAM:

The erection of Cougar Dam, a U. S. Army Corps of Engineers' flood control structure, on the South Fork of the McKenzie River in Oregon created a serious upstream passage problem for fish. During construction, the South Fork has been diverted through a tunnel. The diversion is no obstacle for young downstream migrant salmon heading for the ocean. But adult chinook salmon heading upriver are unable to negotiate the fast moving waters in the tunnel.

A temporary fish passage facility, operated by the Corps of Engineers under supervision of the Oregon Fish Commission, has been located just below the dam site to move the important South Fork spring chinook run past the construction area. A cement and steel adaptation of the ancient weir and funnel trap has been built across the stream. The weir shunts the salmon into a cement chamber. A strong current of water leads them next through a funnel entrance into a steel tank. When 20 to 50 fish are in the tank the entrance is closed and the steel tank trap is lifted by crane to a waiting truck. Water-recirculating hoses and an air line

are attached to the tank and the salmon are hauled seven miles upstream to the release site.

The salmon taxi, now in its third season of operation, had moved over a thousand adult salmon from this year's spawning run past the Cougar Dam project by the end of June.

* * * * *

NEW CRAB-TAGGING METHOD:

The success of the Oregon Fish Commission's new Dungeness crab-tagging program became more apparent as the season advanced, according to the head of shellfish investigations at the Newport Laboratory at Newport. He emphasized that the retention of the tag through several successive sheddings represents a major breakthrough in the study of the migration, distribution, and growth rates of crabs. An insertion point was found along the splitting line of the crab shell which makes retention possible, and paves the way to a much more comprehensive study of crabs. Two types of tags are used in the operation, a nylon spaghetti-type and a plastic dart-type tag. According to the Laboratory chief, more has been learned in the past year regarding growth rate than was determined during several previous seasons of study. The value of tagging efforts in the past was limited by the fact that crabs shed their shells as often as two or more times each year, with the tag being lost at the first shedding.

The Laboratory chief stated that as of July 1962, over 100 recoveries had been made from the 1,000 specimens released last summer with the new tag. More were being reported almost daily. One recovered crab was tagged in July 1961 in the Sally's Bend area of Yaquina Bay and recaptured in June 1962. This crab, when tagged, was of sub-legal size, measuring $4\frac{1}{2}$ inches across the back. It had grown to $6\frac{1}{2}$ inches in width, had shed its shell twice, and regenerated a claw which was missing when tagged.

The Commission's biologist pointed out that the public could render a valuable service in the study of this important food species by reporting tag recoveries. "So far we have received tags from both ocean- and bay-caught crabs," he said, "and recoveries have been made as far from the Yaquina Bay tagging locale as Alsea Bay, some 20 miles

down the coast." If crab fishermen would send in the carapace, or back shell, and the tag, along with details regarding location and date of catch, the information gained would be of great value in the management and development of this important resource. According to the Laboratory chief, occasionally a tag is returned without the back shell, and while these are helpful in the study, the back shells are of very great importance as they are the means of determining growth rate.

Note: See Commercial Fisheries Review, May 1962 p. 25.

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RAZOR CLAM TAGGING STUDIES:

A method of tagging razor clams that will help provide biological facts to guide clam conservation measures has been devised by Oregon Fish Commission biologists. The razor clams are tagged by drilling a small hole through the upper edge of the shell. One end of a monofilament fishing line four feet in length can then be tied to the clam's shell. Color-coded plastic beads are slipped on the line to identify individual clams. A float one-half inch in length is then tied to the other end of the monofilament line and the clam is returned to the beach.

Periodically the tagged clams are dug and examined to determine the rate of growth and the extent of movement from one area of the beach to another. The Oregon Fish Commission has requested sport and commercial clam diggers to avoid removing tagged razor clams from the beach. In most tagging programs, the recovery and reporting of tagged specimens is desired. But tagged razor clams are an exception at present.



Oysters

PROGRESS IN DEVELOPMENT OF CHEMICAL CONTROL METHOD FOR ENEMIES:

Various aspects of a chemical control method for oyster enemies are being studied in Lewis Gut, an arm of Bridgeport Harbor. It is traditionally known as an area where oysters set quite consistently, and where growth of young adult oysters is quite rapid. That area is also known as a "drill hole." During recent years, that oyster-seed-producing section of Long Island Sound has not



Planting of adult clams, *Mercenaria (Venus) mercenaria*, on experimental lots in New Haven Harbor prior to their treatment with different concentrations of drill-controlling chemicals.

been extensively used because of the predatory oyster drills.

Chemical treatment was applied on June 27 and 29, 1962, by biologists of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Milford, Conn. Approximately 30 acres of the bottom were treated using the Laboratory's formula, consisting of a mixture of sand, Polystream and Sevin, at the rate of 5 yards of sand per acre. Biologist-divers examining the bottom of the "Gut" after treatment found that all forms of snails had been affected. This included oyster drills, *Urosalpinx* and *Eupleura*, and conchs, such as *Busycon* and *Polinices*. The *Polinices* is the arch enemy of clams. It kills them by boring holes through the shell near the umbo and then consuming the molluscan meats through the holes. The rest of the clam was affected only slightly, or not at all. The only exception was noted among the worms, which were seen twisting out of their burrows.

It is too early to evaluate all aspects of this experiment on oysters because final conclusions may be drawn only at the end of the season. But it can be stated now, that the chemical treatment reduced the oyster drill population by more than 99 percent.

A method for determination of Polystream in meats of oysters and clams has been successfully developed and has been submitted to the Pesticide Branch, Division of Food, Food and Drug Administration, for approval. Quantities of Polystream of less than 0.05 parts per million in shellfish meats can now be accurately detected.

Using newly-developed analytical methods, preliminary tests of samples, collected from the area receiving twice the maximum dose of treated sand needed to exterminate drills, indicated that although Polystream is present in minute quantities in oyster meats collected soon after treatment of the beds, this residue almost completely disappears within 120 days even though the oysters remain on the chemically-treated bottom. A sample of clam meats, taken 120 days after the bed had been treated, showed no traces of Polystream. The oysters and clams were planted on the experimental beds several days before the chemically-treated sand was spread over them.

As reported earlier concerning use of the insecticide Sevin, the second component of the Laboratory's formula, no traces of it were found in oysters or clams two weeks after the treatment.

Regardless of these promising preliminary results, no final conclusions as to the safety of the method have been formed. That will be possible only after examination of much larger numbers of samples of clam and oyster meats from areas treated in various manners, and after the results of these examinations are studied and accepted by the U. S. Public Health Service and the Food and Drug Administration.

The Milford Laboratory was informed by a marine biologist of the State of Oregon that, by using the Milford Laboratory's formula at the rate of 1,000 pounds of Polystream Sevin-treated sand per acre in their experiments, they achieved near absolute extermination of the mud shrimp, *Upogebia* and *Callianassa*. The experiment demonstrated that two other enemies of oysters may be easily and cheaply controlled at an approximate cost of \$10 per acre. Since some of the shrimp-infested oyster grounds of the Pacific Northwest formerly produced up to 1,000 bushels of oysters a year, the cost of controlling mud shrimp may be only about one cent per bushel, or even less if the treated ground does not become reinfested for several years. (Bulletin No. 2, July 26, 1962.)

* * * * *

LONG ISLAND SOUND OBSERVATIONS ON SPAWNING AND SETTING AS OF JULY 26:

Setting of Starfish: The first setting of starfish appeared on the collectors on June 27. They were most common in the Bridgeport area. Starfish setting has continued since

that date, reaching its highest between July 12 and 16 and then decreasing. Thus far, nevertheless, starfish setting has remained heaviest in the Bridgeport area although one station at a 30-foot depth in Milford also showed quite an intensive setting of starfish between July 2 and 12, the U. S. Bureau of Commercial Fisheries Biological Laboratory, Milford, Conn., reports.

Setting of Oysters: Systematic studies of the plankton collected at 3 stations have been conducted since the oyster spat collectors were placed in the water in June. Plankton samples from the auxiliary stations, including one station on Lot 152 in New Haven Harbor and 3 stations in Lewis (Bridgeport) Gut, are also collected as a matter of routine. Each sample consists of the plankton contained in 250 gallons of water.

The numbers of bivalve larvae have been unusually light all summer. Oyster larvae first appeared about July 18 at 2 stations. Several days later, on July 23, 25 oyster larvae per 250 gallons of water were recorded at one station; 5 at another station; and 10 at another. All of these were mature, ready-to-set individuals. No oyster larvae of any age were found in samples taken at the Bridgeport Station or in Lewis Gut, where extensive experiments on chemical control of drills are conducted, but copepods, crab, and barnacle larvae, as well as larvae of gastropods and worms, were present in large numbers and appeared normal.

The first setting of oysters occurred on July 18. Thus, once again, the formula for prediction of the beginning of setting, which states that, "setting is normally expected to occur on July 19 \pm 4 days," proved to be correct. At first, recently-set oysters were found only at two stations in the New Haven area, but later the setting became of a more general nature, being the most intense at 3 stations. A light setting also occurred in the Milford area, while virtually none took place in Bridgeport.

Because of the presence of mature larvae in plankton samples collected in New Haven and because many oysters on the collectors removed from the water July 23 were only a few hours old, good setting was expected to continue for several more days at 3 stations. If the intensity is maintained at about the same level, or if it increases, the industry may expect a set of commercial importance in that area provided, of course, that it can be protected against predators.

Biologists of Milford Laboratory, using information obtained from studies of plankton samples and other observations, are advising the members of the Connecticut oyster industry as to where shells should be planted to secure the best possible results. For example, they advised against planting shells at the time in the Bridgeport area where no setting was occurring. Instead, it was suggested that advantage be taken of the setting in the New Haven area by planting shells in that location.

In mid-July several auxiliary stations for observations on spawning and setting of oysters and starfish were established. On one of the stations located in New Haven Harbor near Lighthouse Point, studies will be conducted on intensity of oyster and starfish setting on chemically-treated and untreated oyster shells planted as cultch. Five stations were established in Lewis Gut where experiments on extermination of drills by the Laboratory's chemical method are now in progress. (Bulletin No. 2, July 26, 1962.)

* * * * *

MARYLAND OBSERVATIONS ON SPAWNING AND SETTING, JULY 1962:

July of this year was unseasonably dry and cool. This has prevented further strong rises in water temperatures that continued to run around 77° F. locally, a little below seasonal normal, but favorable to oyster spawning. Salinities continued

above normal, according to the "Special Oyster Bulletin" of the Maryland State Chesapeake Biological Laboratory, Solomons.

The combination of long continued summer water temperatures, attained earlier than usual in May, and the above normal salinities resulted in an early build-up of the fungus parasite, *Dermocystidium*, in the southern portions of the Maryland Chesapeake area (from the vicinity of Solomons to Virginia). A number of oysters heavily infected by the parasite were found on trays in St. Marys River, Holland Straits, and at Solomons. There was an accompanying mortality on those trays that is definitely above normal for this season and among some groups quite heavy.

Oysters crowded together on a tray are known to develop a higher degree of infection by *Dermocystidium* than do oysters that are more scattered on the bottom. However, oysters infected by the parasite also are appearing on natural beds in the affected areas. On Cinder Hill in Holland Straits 17 out of 20 living oysters collected on July 19 showed positive *Dermocystidium* infection, mostly light. A number of recent boxes were present on the bar. Gapers from trays and the one gaper (dead oyster) taken from a natural rock were all heavily parasitized by the fungus to the extent that the oyster deaths were almost certainly due to *Dermocystidium*.

High water temperatures and high salinity favor development of the fungus and intensity of infection with subsequent oyster mortality tending to increase in proportion to the length of time that water conditions remain favorable to the parasite. Usually, peak losses occur in late summer. The present conditions indicate that such losses will be higher than usual during 1962. Future seasonal conditions, however, will influence the severity of the expected mortality.

Dermocystidium has shown no tendency to spread among oysters growing in low-salinity water such as usually is found over the extensive oyster-growing grounds above the Solomons area. Moving infected oysters to lower salinity, however, does not kill the parasite and oysters seriously affected by it will continue to die. Oysters on a densely-populated bottom tend to develop a higher degree of infection than do oysters that are more scattered because of the easier transmission of the fungus from one oyster to another. Young oysters generally appear to be immune to the parasite but develop infections during the second year and may undergo heavy losses during the third year in areas where *Dermocystidium* is common.

Sizable losses from the parasite have occurred during other seasons in St. Marys River and in Holland Straits where oyster populations are fairly dense. Also, on several bars in Pocomoke Sound and in upper Tangier Sound oyster losses occurred in the past on bars that were then densely populated but now contain fewer oysters.

Losses can be reduced by not permitting dense populations of oysters to remain in *Dermocystidium* infested areas for more than two years before harvesting them. In portions of the Gulf Coast where this parasite is a very serious pest, it has been found that better oyster crops can be produced when oysters are harvested while young. Furthermore, the more rapid growth of young oysters results in a higher bushel return from two successive crops of young (3 $\frac{1}{2}$) oysters than from a single crop that is left for the same total number of years to produce oysters that are larger but slower-growing and fewer in numbers due to the natural mortality over a longer period.

No increases of infection by the parasite MSX were observed through July this year. The principal oyster mortalities associated with MSX were observed to occur in early summer and again in late summer and early fall with scattered deaths throughout the rest of the year. It is too soon for the late summer losses to be apparent this season. Since MSX infection in Maryland has continued to be quite low and confined to the Tangier-Pocomoke Sound area, it is hoped that it will not be a serious problem in this year's oyster production.

The number of oyster spat attached to clean test shells exposed for one-week periods continued to increase in most areas. A substantial set already had occurred in St. Marys River and along the eastern side of the Bay at Punch Island and Barren Island.

* * * * *

MARYLAND SETTING OBSERVATIONS, JULY 1962:

An increase in oyster setting rates in the Tred Avon River and Broad Creek, Md., compared with last year was apparent, according to a July 26, 1962, report from the Biological Laboratory of the U. S. Bureau of Commercial Fisheries, Oxford, Md. This development was revealed in laboratory counts of oyster spat in bottom collector bags tended on a weekly replacement schedule at 5 stations in the Tred Avon River and 4 stations in Broad Creek. All stations were occupied both years. Setting rates are expressed as the accumulated counts of spat on 20 inner oyster shell faces per bag per week from late June to mid-July, approximately half the expected most active oyster-setting season.

Counts of setting at the Cedar Point station were of some interest because they demonstrated differences in bottom and off-bottom rates. In addition to the regular bottom weekly collector bags at Cedar Point this year, the Laboratory tended weekly bags suspended in 1-foot strata off the bottom to just below the low-water mark.

* * * * *

WEED "STEALS" OYSTERS PLANTED IN OYSTER RIVER:

Deliberate or accidental introduction of a foreign species into oyster coastal waters often upsets the balance of nature and causes unexpected trouble. Some years ago a Japanese species of green marine weed known as Codium fragile appeared in Peconic Bay at the eastern end of Long Island and rapidly spread over the bottoms of planted oysters. In the spring of 1961, several thousand bushels of Peconic Bay oysters, apparently clean of large fouling plants, were planted in Oyster River near Chatham, Mass. Shortly after that Codium was found on shellfish grounds, attached to newly planted stock. Its rapid growth during the following months amazed the oystermen and caused them considerable concern when it became necessary to spend extra time in cleaning the oysters for marketing.

Codium continued its rapid growth in the summer of 1962. Specimens examined at the U. S. Bureau of Commercial Fisheries Woods Hole Laboratory in July 1962 were much heavier and larger than the oysters to which they were attached. The unwanted weeds were nearly 3 feet high. On good sunny days so many gas bubbles were formed at the

blunt, sausage-like tips of the Codium branches, that both oysters and the attached plants floated in the water and were carried away by the tides. Codium has become an "oyster thief." In the past weeds that "steal" oysters were rarely found on shellfish grounds of the American coast.



Pacific Territories

EXPANDED FISHERIES DEVELOPMENT PROGRAM PLANNED:

Programs to increase the fishery economy, said Secretary of the Interior Stewart L. Udall, is one of the priority points of a five-point program to accelerate the development of the Pacific areas (Samoa, Guam, and the Pacific Trust Territory) administered by the United States. The announcement of the five-point program to accelerate social, political, and economic progress in those Pacific areas was made by the Secretary following his return from an inspection tour. The tour included an inspection of fisheries facilities in the areas visited.

Secretary Udall said priority would be given to fisheries development programs which represented the best immediate hope of islanders for economic self-sufficiency. This would include not only development of such facilities as tuna canneries, but the training of natives in long-line fishing, and boat construction and operation. Most of the natives in those areas are skilled only in fishing close to shore, and have neither the knowledge or equipment for deep-sea fishing.

Negotiations have been under way with some of the major fisheries firms which would result in new sources of income for the islanders. A new tuna cannery which will employ about 400 persons, is planned for American Samoa. A tuna cannery in American Samoa operated by a United States firm has been packing tuna for several years.



South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, APRIL-JUNE 1962:

The following is a report on the progress of biological research by the Bears Bluff Laboratories, Wadmalaw Island, S. C., for April-June 1962:

Oyster Research: A number of small sub-tidal oyster beds have been located and charted in the last four months off South Carolina. Because these "deep-water" beds are usually quite small, they have little commercial value but, being generally unmolested, the oysters are superior in quality and configuration to intertidal oysters. Experimental planting is being done to try to enlarge several of these sub-tidal oyster beds.

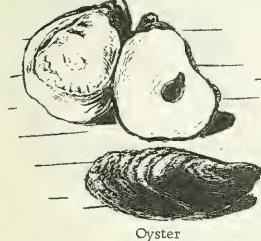
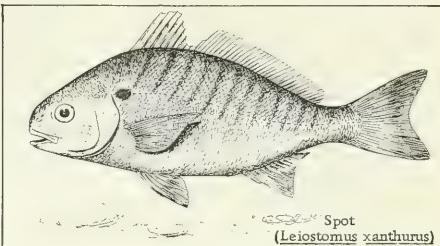
The rather large-scale planting of the substitute cultch (solite) made last August did not produce oysters. One cause of failure may have been silting. Recently the solite beds in Toogoodoo Creek were washed by slowly running the Laboratory's boat back and forth over the beds at highwater. This

did clear up some silt and left fresh-looking solite exposed. About fifty standard bushels of the solite were dredged, washed, and replanted in Leadenwah River. To date there has been only a light set on the material. The set is not comparable to that noted on steamed-shell cultch.

Bears Bluff has been cooperating with a Yonges Island canning company in an effort to rehabilitate old oyster beds in Beaufort County in the Fripp Island area. A mechanical raking device was used to dig off the tops of the high old oyster beds in an attempt to soften them, lower the elevation, and expose clean shell which would serve as fresh cultch for a new population of oysters.

Shrimp Research: Experimental plankton tows at regular stations throughout the in-shore area were continued during the second quarter. Results showed that postlarval brown shrimp were more than five times as abundant during the 1962 recruitment period as in 1961. Postlarval brown shrimp entered tidal sounds and rivers for a longer period of time this year and were more consistent in quantity than during either 1961 or 1960. Postlarval white shrimp began to show up in plankton catches in mid-May and became increasingly abundant towards the end quarter. These postlarvae should reach

peak abundance sometime in July, judging from data obtained in previous years.



Oyster

Otter-trawling at regular shrimp survey stations indicated that spot have been about 30 percent more numerous during the April-June quarter of this year as compared with that of 1961. Croakers showed an increase of over 40 percent during the present quarter as compared with last year's. White shrimp were only slightly more numerous in experimental trawl catches this quarter than in 1961, but brown shrimp showed a considerable increase this year, being almost 60 times as plentiful at regular stations as they were during 1961.

Bears Bluff Laboratory's cast-net records also indicate a great increase in numbers of brown shrimp this year. Over 20 times as many brown shrimp were taken at cast-net stations in May and June of 1962 as in the same period of 1961. This indicates that the commercial catch of brown shrimp should be considerably better than in 1961, and quite possibly the best in the past three years. If white shrimp also have a successful season, a bumper crop of shrimp should result this year.

Pond Cultivation: Two one-acre experimental shrimp ponds were drained and harvested during this quarter. One of the ponds was drained and closed off completely on February 12, 1962. This pond was then stocked by means of pumping water from a nearby creek with an 8-inch irrigation pump. During the period of February 12 to March 30, 1962, approximately $3\frac{1}{2}$ million gallons of water were pumped into this pond. On April 16, the pond was treated with rotenone (3 lbs. per acre foot) to remove predatory fish. On June 25 the pond was drained and harvested. Approximately 19 pounds of brown shrimp were taken and the number of fish harvested was minimal, indicating that the rotenone treatment had been successful.

The other one-acre pond had been drained on February 1, 1962, and screened with $\frac{1}{2}$ -inch wire mesh. The pond flood gates were opened on February 12, 1962, and allowed to remain open until March 30 for natural stocking of postlarval brown shrimp. On April 16, 1962, this pond was also treated with rotenone in order to remove fish. On June 26, 1962, the pond was drained and harvested. Seventeen pounds of brown shrimp were collected. The presence of large numbers of fish in the pond was surprising, and it is felt that a complete kill was not obtained by the rotenone treatment in April.

A similar experiment comparing the pumping method of stocking with the flowing method was made last summer during the season when white shrimp were present. The purpose of this recent experiment was to further evaluate the different methods. In this case, the pumping method was equally as productive as the flowing method. In last year's experiment the natural flowing method was about 2.5 times more effective. However, in that case less water was pumped. The results of the two experiments are really not comparable nor conclusive. They do show that stocking shrimp by means of a pump is possible. However, in both cases the natural flowing method seems to be more feasible when viewed from a cost basis. Pumping is expensive.

Note: See Commercial Fisheries Review, May 1962 p. 29.

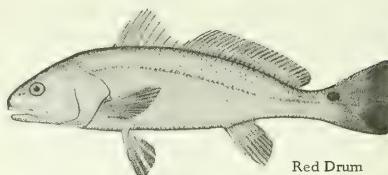


Sport Fishing

TROPICAL PACIFIC GAME FISH SCHOOLING AND FEEDING BEHAVIOR STUDY:

A three-year study of the schooling and feeding behavior of several Pacific game fish was begun in July 1962. The U. S. Bureau of Sport Fisheries and Wildlife has employed a graduate student at the University of California at Los Angeles to make the study. The study will provide information on the roosterfish, scad, grouper, yellowtail, barracuda, and sand bass. Field observations will be conducted in the lower Gulf of California. Underwater observations by camera and tape recorder will be emphasized.

This is the third graduate study supported by the Bureau of Sport Fisheries and Wildlife in its marine program. Two others, now



Red Drum

in progress at the University of Miami, concern the bluefish and red drum. The studies are designed to furnish life history information on important game fish, and to encourage promising students to make a career in fisheries biology.



Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS, JULY 1962:

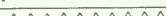
Item and Period	1962	1961	1960	1959	1958
.....(1,000 Lbs. Heads Off).....					
<u>Total Landings, So. At. & Gulf States:</u>					
September	-	9,691	18,832	18,331	15,847
August	-	10,944	20,441	18,595	14,173
July	14,000	10,500	21,746	17,493	13,457
Jan.-June	32,100	31,030	36,775	35,511	36,098
Jan.-Dec.	-	91,395	141,035	130,660	116,552
<u>Quantity canned, Gulf States 1/</u>					
September	-	785	2,236	2,108	2,825
August	-	1,206	5,041	2,427	2,809
July	3,800	3,042	6,319	3,085	4,805
Jan.-June	8,000	5,405	9,840	10,938	7,109
Jan.-Dec.	-	15,760	28,594	24,679	26,404
<u>Frozen inventories (as of each mo.)^{2/}</u>					
September 30	-	13,361	26,119	18,079	16,896
August 31	-	12,728	20,171	23,780	15,274
July 31	4/	14,849	17,397	22,357	12,351
June 30	13,796	19,416	15,338	19,283	10,664
May 31	13,904	24,696	17,540	21,137	11,013
January 31	-	31,842	34,332	30,858	17,963
<u>Imports 3/</u>					
September	-	8,190	7,541	7,620	7,471
August	-	6,743	6,407	5,107	6,628
July	4/	6,635	7,319	7,861	6,340
June	9,397	8,065	8,932	8,300	6,018
Jan.-May	54,604	49,103	42,493	41,526	26,260
Jan.-Dec.	-	126,268	113,418	106,555	85,393

^{1/}Pounds of headless shrimp determined by multiplying the number of standard cases by 33.

^{2/}Raw headless only; excludes breaded, peeled and deveined, etc.

^{3/}Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.

^{4/}Not available.



Tuna

BLACKFIN TUNA STUDIED TO DETERMINE FEDERAL SPECIFICATION REQUIREMENTS:

Six small blackfin tuna from the Gulf of Mexico were canned by the U. S. Bureau of Commercial Fisheries technological laboratory at Pascagoula, Miss., during early summer. The objective was to determine if blackfin tuna from the Gulf would meet Federal specification requirements for canned tuna. The first examination revealed that blackfin tuna should easily meet the U. S. Food and Drug Administration mandatory standard of identity for light meat tuna. The quality of the product was good and also should meet the Federal Purchasing Specifications.



United States Fisheries

COMMERCIAL FISHERY LANDINGS, JANUARY-JUNE 1962:

Total Landings: Landings of fish and shellfish in the United States during the first 6 months of 1962 amounted to about 8 million pounds more than during the comparable period of 1961. Production of edible fish was about 35 million pounds less than in the first half of 1961, while landings of nonedible species, principally menhaden, were up 43 million pounds.

Menhaden: During the first 6 months of 1962, landings amounted to 833 million pounds--up 51 million pounds over 1961.

Tuna: Landings in California (including transshipments of United States-caught fish from South America) totaled 151 million pounds to July 14, 1962--down about 24 million pounds compared with the same period in 1961. Purse-seine landings in California dropped 9 million pounds, clipper-fleet landings were down about 10 million pounds, and transshipments declined 5 million pounds.



Fig. 1 - Shrimp trawlers tied up at a dock in Thunderbolt, Ga.

Salmon: On the basis of the reported pack of canned salmon, it was estimated that the Alaska catch to July 15, 1962, totaled almost 80 million pounds--a decline of about 40.5 million pounds or 34 percent compared with the same period of 1961.

Mackerel: At mid-year, 1962 landings of jack mackerel (38.3 million pounds) exceeded those in the previous year by 12 million pounds; while the catch of Pacific mackerel (16 million pounds) declined slightly during the same period.

United States Commercial Fishery Landings of Certain Species for Periods Shown, 1962 and 1961				
Species	Period	1/1962	1961	Total 1961
		.....(1,000 Lbs.).....		
Anchovies, Calif. . .	6 mos.	1,100	2,074	6,500
Cod:				
Maine	5 mos.	1,100	1,069	2,507
Boston	6 "	12,300	11,309	18,837
Gloucester	6 "	1,700	1,411	3,358
Total cod		15,100	13,789	24,702
Haddock:				
Maine	5 mos.	700	1,114	2,940
Boston	6 "	45,800	45,239	84,093
Gloucester	6 "	9,700	8,320	15,025
Total haddock		56,200	54,673	102,058
Halibut 2/:				
Alaska	6 mos.	14,200	12,530	25,077
Wash. & Oreg.	6 "	7,200	8,693	14,947
Total halibut		21,400	21,223	40,024
Herring:				
Maine	5 mos.	3,800	40	54,463
Alaska	6 "	6,700	15,200	48,600
Industrial Fish				
Me., & Mass. 3/	6 mos.	10,800	11,211	41,851
Mackerel:				
Jack	6 mos.	38,300	25,910	98,900
Pacific	6 "	16,100	17,274	39,100
Menhaden	6 mos.	833,300	782,114	2,308,000
Ocean perch:				
Maine	5 mos.	28,000	30,126	77,350
Boston	6 "	300	267	701
Gloucester	6 "	32,300	29,328	53,991
Total ocean perch		60,600	59,721	132,042
Salmon, Alaska . . .	to July 15	79,700	120,200	264,800
Scallops, sea, New Bedford (meats) . . .	6 mos.	10,000	9,744	20,648
Shrimp (heads-on):				
So. Atl. & Gulf . . .	6 mos.	53,100	52,134	153,400
Washington	6 "	600	607	1,459
Squid, Calif.	6 mos.	5,700	882	5,400
Tuna, Calif.	to July 14	151,300	175,460	307,263
Whiting:				
Maine	5 mos.	3	-	14,147
Boston	6 "	70	45	144
Gloucester	6 "	8,300	6,750	51,598
Total whiting		8,373	6,805	65,889
Total all above items . . .		1,372,173	1,369,061	3,715,099
Other 4/		306,327	301,425	1,439,901
Grand Total		1,678,500	1,670,486	5,155,000

1/Preliminary.

2/Estimated.

3/Excludes menhaden.

4/Includes landings for species not listed.

Note: Finfish generally converted to round weight, crustaceans to weight in the shell, and mollusks reported in meats only.



Fig. 2 - Boxes of iced fish on a truck, Weems, Va.

Scallops: New Bedford landings through June 1962 totaled about 10 million pounds--256,000 pounds more than in the previous year. Landings of scallops during 1961 were the largest on record.

Shrimp: Landings in the South Atlantic and Gulf States during the first 6 months of 1962 amounted to 53 million pounds--about 1 million pounds more than in 1961.

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FISH STICKS AND PORTIONS PRODUCTION, APRIL-JUNE 1962:

United States production of fish sticks amounted to 16.1 million pounds and that of fish portions was 18.2 million pounds during the second quarter of 1962, according to preliminary data. This was a gain of 3 percent in fish sticks and 47 percent in portions as compared with the same quarter of 1961. The increase in portions was mainly due to greater production of raw breaded portions (up 4.3 million pounds).

Table 1-U.S. Production of Fish Sticks by Months and Type, April-June 1962 1/			
Month	Cooked	Raw	Total
.....(1,000 Lbs.).....			
April	5,028	452	5,480
May	5,152	457	5,609
June	4,669	389	5,058
Total 2nd Qtr. 1962 1/	14,849	1,298	16,147
Total 2nd Qtr. 1961 .	14,589	1,067	15,656
Tot. 1st 6 mos. 1962 1/	34,380	2,436	36,816
Tot. 1st 6 mos. 1961 .	33,722	2,350	36,072
Tot. Jan.-Dec. 1961 .	65,006	4,813	69,819

Table 2 - U. S. Production of Fish Sticks by Areas,
April-June 1962 and 1961

Area	1/1962		2/1961	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	23	13,229	22	13,421
Inland & Gulf States .	4	1,892	6	1,232
Pacific Coast States .	7	1,026	10	1,003
Total	34	16,147	38	15,656

1/Preliminary. 2/Revised.

Table 3 - U.S. Production of Fish Sticks by Months, 1958-1962

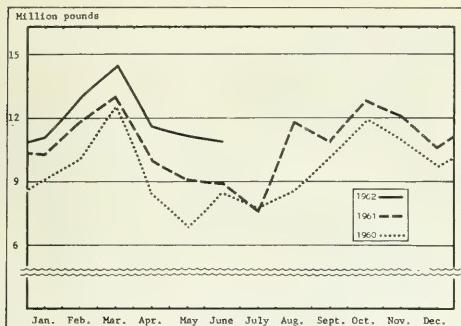
Month	1/1962	2/1961	1960	1959	1958
	.....(1,000 Lbs.).....				
January	6,104	6,091	5,511	6,277	5,471
February	6,359	7,092	6,542	6,352	5,925
March	7,706	7,233	7,844	5,604	5,526
April	5,480	5,599	4,871	4,717	4,855
May	5,609	5,129	3,707	4,407	4,229
June	5,058	4,928	4,369	4,583	4,702
July	-	3,585	3,691	3,790	4,574
August	-	6,937	5,013	3,879	4,358
September	-	5,216	5,424	5,353	5,328
October	-	6,143	6,560	5,842	5,485
November	-	6,298	6,281	4,831	5,091
December	-	5,628	5,329	4,743	5,467
Total	-	69,903	65,142	60,378	61,011

1/Preliminary. 2/Revised.

Table 4 - U. S. Production of Fish Portions by Months and Type, April-June 1962 1/

Month	Breaded			
	Cooked	Raw	Total	Unbreaded
.....(1,000 Lbs.).....				
April	1,427	4,773	6,200	149
May	1,135	4,471	5,606	144
June	1,043	4,864	5,907	175
Tot. 2nd Qtr. 1962 1/ ..	3,605	14,108	17,713	468
Tot. 2nd Qtr. 1961	2,116	9,835	11,951	451
Tot. 1st 6 mos. 1962 1/ ..	6,537	29,009	35,546	1,042
Tot. 1st 6 mos. 1961	4,888	21,586	26,474	964
Tot. Jan.-Dec. 1961	11,003	46,783	57,786	2,061

1/Preliminary.



U. S. production of fish sticks and portions, 1960-1962.

Table 5 - U. S. Production of Fish Portions by Areas, April-June 1962 and 1961				
Area	1/1962		2/1961	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	23	9,937	24	6,484
Inland & Gulf States	7	7,623	12	5,488
Pacific Coast States	8	621	6	430
Total	38	18,181	42	12,402

1/Preliminary.
2/Revised.

Table 6 - U. S. Production of Fish Portions by Months, 1958-1962				
Month	1/1962	2/1961	1960	1959
January	5,102	4,303	3,632	2,692
February	6,374	4,902	3,502	1,254
March	6,931	5,831	4,706	3,225
April	6,350	4,484	3,492	2,634
May	5,749	3,879	2,253	2,684
June	6,082	4,039	3,995	3,247
July	-	3,886	4,088	2,227
August	-	4,987	3,558	2,796
September	-	5,769	4,631	3,558
October	-	6,783	5,275	4,314
November	-	5,813	4,790	3,483
December	-	5,215	4,459	3,262
Total	-	60,061	49,381	37,147

1/Preliminary. 2/Revised.

Cooked fish sticks made up 92 percent of the fish stick total. The remaining 8 percent consisted of raw fish sticks. A total of 17.7 million pounds of breaded fish portions (of which 14.1 million pounds were raw) and 468,000 pounds of unbreaded portions were processed during the second quarter of 1962.

Plants on the Atlantic Coast produced the bulk of the fish sticks and portions--23.2 million pounds. The remaining 11.1 million pounds of sticks and portions were produced in Gulf, Inland, and Pacific Coast plants.

During the first 6 months of 1962, fish stick production of 36.8 million pounds was up 2 percent and the fish portions production of 36.6 million pounds was up 33 percent as compared with the first half of 1961.



U. S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED, JULY 1962:

During July 1962, a total of 33 vessels of 5 net tons and over were issued first documents as fishing craft, as compared with 50 in July 1961. There were 23 documents cancelled for fishing vessels in July 1962 as compared with 24 in July 1961.

Table 1 - U. S. Fishing Vessels 1/—Documents Issued and Cancelled, by Areas, July 1962 with Comparisons

Area (Home Port)	July		Jan.-July		Total 1961
	1962	1961	1962	1961	
Issued first documents^{2/}:					
New England	5	4	20	21	33
Middle Atlantic	-	1	2	5	12
Chesapeake	2	5	23	41	75
South Atlantic	4	5	21	29	47
Gulf	9	12	62	73	100
Pacific	13	22	100	124	149
Great Lakes	-	1	1	9	12
Puerto Rico	-	-	-	2	2
Total	33	50	229	304	430
Removed from documentation^{3/}:					
New England	1	3	12	11	20
Middle Atlantic	-	1	26	18	34
Chesapeake	5	3	13	21	28
South Atlantic	4	3	22	18	30
Gulf	10	4	69	60	103
Pacific	3	7	72	60	112
Great Lakes	-	3	12	8	14
Hawaii	-	-	3	-	-
Puerto Rico	-	-	1	-	-
Total	23	24	230	196	341

1/For explanation of footnotes, see table 2.

Table 2 - U. S. Fishing Vessels 1/—Documents Issued and Cancelled, by Tonnage Groups, July 1962

Gross Tonnage	Issued ^{2/}	Cancelled ^{3/}	(Number)	
			5-9	10-19
5-9	5	6	5	6
10-19	16	8	16	8
20-29	3	1	3	1
30-39	1	1	1	1
40-49	2	1	2	1
50-59	-	-	-	1
60-69	2	2	2	2
70-79	2	-	2	-
90-99	-	-	-	1
110-119	-	-	-	1
120-129	-	-	-	1
220-229	1	-	1	-
550-559	1	-	1	-
Total	33	23	33	23

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2/Includes undocumented vessels previously removed from records. Vessels is included in tonnage groups as fishing craft were built: 24 in 1962, 2 in 1961, 1 in 1960, 1 in 1951, 5 prior to 1951. Assigned to areas on the basis of their home ports.

3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.

Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

* * * *

**DOCUMENTATIONS ISSUED AND
CANCELLED, JUNE 1962:**

During June 1962, a total of 52 vessels of 5 net tons and over were issued first documents as fishing craft, as compared with 64 in June 1961. There were 34 documents cancelled for fishing vessels in June 1962 as compared with 26 in June 1961.

Table 1 - U. S. Fishing Vessels^{1/}--Documentations Issued and Cancelled, by Areas, June 1962 with Comparisons

Area (Home Port)	June		Jan.-June		Total 1961
	1962	1961	1962	1961	
.....(Number).....					
Issued first documents ^{2/} :					
New England	2	2	15	17	33
Middle Atlantic	-	2	2	4	12
Chesapeake	5	11	21	36	75
South Atlantic	4	6	17	24	47
Gulf	15	9	53	61	100
Pacific	25	31	87	102	149
Great Lakes	1	3	1	8	12
Puerto Rico	-	-	-	2	2
Total	52	64	196	254	430
Removed from documentation ^{3/} :					
New England	-	2	11	8	20
Middle Atlantic	2	-	26	17	34
Chesapeake	2	-	8	18	28
South Atlantic	2	3	18	15	30
Gulf	13	12	59	56	103
Pacific	10	9	69	53	112
Great Lakes	4	-	12	5	14
Hawaii	-	-	3	-	-
Puerto Rico	1	-	1	-	-
Total	34	26	207	172	341

^{1/}For explanation of footnotes, see table 2.

Table 2 - U.S. Fishing Vessels^{1/}--Documents Issued and Cancelled, by Tonnage Groups, June 1962

Gross Tonnage	Issued ^{2/}	Cancelled ^{3/}	.....(Number).....		
				Pounds	US\$
5-9	2		4	362	385
10-19	24		15	12,639	8,027
20-29	5		3	10,848	8,336
30-39	6		2	871	705
40-49	1		2	260	133
50-59	3		2	32,732	152,862
60-69	-		2	1,592	23,751
70-79	8		1		
110-119	1		-		
130-139	1		-		
250-259	-		1		
370-379	-		1		
490-499	1		1		
530-539	-		1		
Total	52		34	59,304	194,199

^{1/}Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

^{2/}Includes undocumented vessels previously removed from records. Vessels issued first documents as fishing craft were built 38 in 1962, 2 in 1961, 1 in 1953, prior to 1951, and 3 unknown. Assigned to areas on the basis of their home port.

^{3/}Includes vessels reported lost, abandoned, foreited, sold alien, etc.

Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.



U. S. Foreign Trade

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-July 28, 1962, amounted to 32,594,317 pounds (about 1,552,110 std. cases), according to data compiled by the Bureau of Customs.

This was 16.8 percent more than the 27,898,898 pounds (about 1,328,519 std. cases) imported during January 1-July 29, 1961.

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1962 at the 12½-percent rate of duty is limited to 59,059,014 pounds (about 2,812,000 std. cases of 48 7-oz. cans). Any imports in excess of the quota are dutiable at 25 percent ad valorem.

* * * * *

FISHERY PRODUCTS IMPORTS FROM U.S.S.R.:

United States imports of fishery products from the U.S.S.R. in 1961 amounted to only 59,000 pounds.

U. S. Fishery Products Imports from U.S.S.R., 1961

Commodity	Quantity	Value
	Pounds	US\$
Antipasto in oil, canned	362	385
Fish in oil, n.e.s., canned	12,639	8,027
Salmon, canned	10,848	8,336
Crab meat, canned	871	705
Fish paste, canned	260	133
Sturgeon roe, salted	32,732	152,862
Sturgeon roe, boiled in air-tight containers	1,592	23,751
Total	59,304	194,199

* * * * *

INSURANCE ON UNITED STATES EXPORTS EXTENDED TO LONGER-TERM POLICIES:

Insurance covering credit and political risks in overseas sales made on terms of up to 5 years is now available to United States exporters. The newly-available medium-term policies can be obtained from the Foreign Credit Insurance Association (FCIA), which operates in cooperation with the Export-Import Bank of Washington.

This is the first time the United States has provided such medium-term assistance for its exporters on an extensive basis, through private business facilities which include ready availability of policy application from insurance agents and brokers.

The FCIA's new coverage was simultaneously announced early in July by the President of the Export-Import Bank in Washington, and by the President of the FCIA in New York.

The FCIA has been issuing short-term export credit insurance (for transactions on terms up to 180 days) since February 5, 1962. Use of the new medium-term policy in conjunction with the existing short-term policy will enable United States exporters to insure against credit and political risks in transactions whose credit terms are anywhere within a 5-year range. In the medium-term policy, exporters will be covered against loss of 85 percent of the financed portion of transactions for both credit and political risks. Credit risks are insolvency of the buyer and protracted default of payment by the buyer; political risks include such government actions as currency convertibility restrictions, export and import restrictions, war, revolution, civil commotion and expropriation.

The new insurance is available on a case-by-case basis. The FCIA will consider applications for a single sale to a foreign buyer or revolving sales to a foreign buyer. Exporters may cover as many or as few of their buyers as they choose during the policy year, since there is no flat "whole-turnover" requirement in the medium-term program. But should an exporter wish to insure on a "whole-turnover" basis, he may do so at a reduced premium and increase the political risk coverage to 90 percent.

As in the short-term policies, a contract form endorsement may be attached to the medium-term policy to extend the coverage during the period of fabrication or manufacture of the product.

Premium rates for the medium-term policy vary according to terms of payment and the buyer's country. Both FCIA and the Export-Import Bank indicate that the premiums and fees for medium-term insurance in the United States compare favorably with those charged by the leading credit insurance systems in other nations. In fact, in some instances, FCIA rates are lower than those charged by foreign insurers.

The FCIA was formed by private insurance companies late in 1961 at the suggestion of the United States Government through the Export-Import Bank. It is an unincorporated association whose membership now numbers 71 companies. Membership is open to all qualified and responsible insurance companies. Both the medium-term export credit insurance policy and the short-term policy are offered to exporters through agents of member companies and general insurance brokers throughout the United States.

Announcement of the FCIA's new medium-term policy rounds out the Association's basic program. The two policies are designed to help United States exporters meet increasing competition from foreign exports who, for the most part, have the benefit of export credit insurance plans abroad.

Two salient benefits will be provided to United States exporters who use FCIA policies.

1. The exporters themselves will be in better position to extend credit to overseas customers, because the substantial portion of risks in the transactions are covered by the insurance.

2. Exporters will be able to obtain financing more readily from commercial banks and other financial institutions when their foreign accounts receivable are so insured.

In addition, commercial banks in the United States should find FCIA policies attractive in connection with the financing of overseas sales, since proceeds of the policies are assignable to banks.



Vessels

FRENCH FISHERY RESEARCH VESSEL VISITS WOODS HOLE, MASS.:

The French fishery research vessel Thalassa docked at the U. S. Bureau of Commercial Fisheries Biological Laboratory, Woods Hole, Mass., July 24-26, 1962. The vessel visited the Laboratory prior to a cruise to Georges Bank and northern Atlantic fishing areas. The chief of the vessel's scientific party explained that the purpose of their trip was to investigate stocks of groundfish, especially those which may now be underexploited. The Bureau's Woods Hole scientists had the opportunity to meet the scientists aboard the vessel, learn something of their work, and examine their equipment. Scien-



Fig. 1 - French fishery research vessel Thalassa arriving at the U. S. Bureau of Commercial Fisheries dock in Woods Hole, Mass.

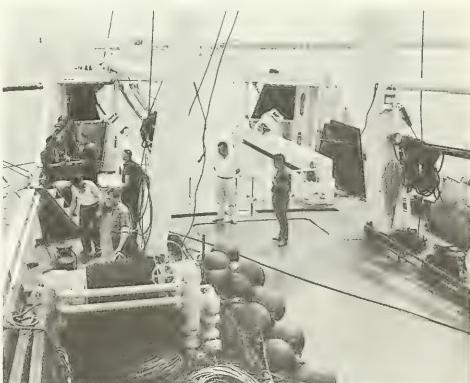


Fig. 2 - Afterdeck of the French vessel Thalassa.

tists on the vessel spent some time ashore conferring with the Bureau's biologists on overlapping studies and problems. A Woods Hole biologist accompanied the vessel on the first leg of her cruise, and he left the vessel at a Nova Scotia port.

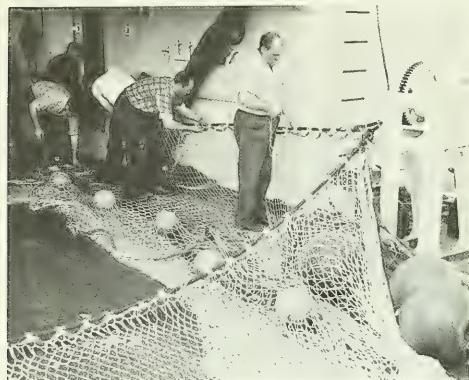


Fig. 3 - Tying net to the head rope of an otter trawl aboard the Thalassa.

The vessel arrived direct from her home port (Brest, France). Also, she planned to explore the commercial stocks of ground-fish on the Grand Banks before returning to France some time in September 1962.

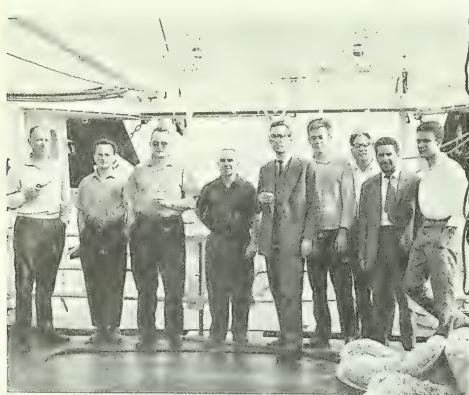


Fig. 4 - Scientists aboard the Thalassa.

A stern trawler with complete biological and chemical facilities, the Thalassa was built at Le Harve in 1960. She is 216 feet

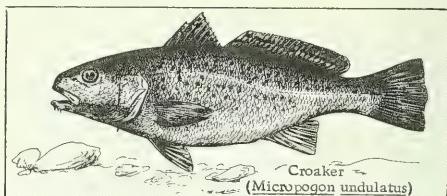
long, 1,481 gross tons and has a maximum range of 12,900 miles. The Thalassa's total complement is a crew of 33 and 22 scientists. On this cruise there were 8 scientists, 2 students, and a visiting Polish fishery biologist aboard.



Virginia

OUTLOOK PROMISING FOR CROAKER POPULATIONS IN CHESAPEAKE BAY SYSTEM:

Improvement in the numbers of croakers inhabiting the Chesapeake Bay system was predicted by marine scientists of the Virginia Institute of Marine Science, Gloucester Point, Va. The prediction made on June 27, 1962, was based on recent winter investigations of the survival of young croakers in up-river areas.



The head of Ichthyology studies at the Institute cited evidence compiled during the past winter indicating a tenfold increase in survival of small croakers over the average of the past five years. He pointed out that these small croakers were spawned in the ocean last fall, and the tiny larvae moved upstream into the brackish-water areas of rivers entering Chesapeake Bay. The supervisor, who is responsible for the Laboratory's young fish sampling program, has been making regular trawl surveys in those upriver areas to determine the abundance of young croakers during fall, winter, and spring, indicating the number of fish arriving, and the number which survive the winter.

The Institute's Ichthyology chief and his co-workers agreed that pinheads (6 to 8 inches in size) would begin to appear in increased numbers late in the summer of 1962, and that the commercial fishery and sport fishery will be considerably improved by 1963. Large croakers from the 1962 spawning season will not appear until 1964.

It was also suggested by the Institute's staff that this does not mean an immediate return to population levels of years prior to the severe cold during the winter of 1957/58. They stated it will take several mild winters in succession and the subsequent successful survival of croaker larvae before a return to high population levels can be expected. They hoped the past 1961/62 mild winter was the first of such a series.

Records kept since about 1880 show the commercial catch of croakers in 1961 was the lowest on record. It was believed the predicted increase should result in a significant improvement.

Croakers spawn offshore along the Continental Shelf each fall. After hatching, the larvae move into the Bay and upstream to approach the brackish-water areas of rivers. Those are the nursery grounds of young croakers during their first winter, which is a very critical time of their life cycle. Survivors of the first winter migrate back downstream with the arrival of spring to join regular croaker migrations. By the end of their first summer, they usually grow to pinhead size and reach adult size by the end of their second year. Rarely does a croaker pass an age of 5 or 6 years. Studies by the Institute also show that the annual mortality of croakers is about 70 percent, only 10 percent of which is caused by fishing.

There was some evidence that the extremely cold winter of 1957/58 had a great deal to do with the severe decline of Chesapeake Bay croaker populations over the past few years. The past mild winter, and the subsequent survival in some abundance of croaker spawn, seems to support that evidence.



Washington

CHINOOK SALMON TAGGING:

For a salmon tagging operation off West Beach, Whidbey Island, Wash., Washington State Department of Fisheries biologists used the drum-seine vessel Sykes. Tagging began June 17 and continued until mid-August. The purpose was to gain information about migration routes and timing of runs of chinook salmon that pass through the West Beach area. The Department needs the information in order to determine whether



Chinook salmon

to manage the West Beach chinook salmon fishery as a separate fishery, or as part of the chinook fishery in Skagit Bay, Wash.

Salmon were tagged only on Saturday, Sunday, and Monday, when the commercial fleet was not operating. As of June 27, a total of 141 chinook salmon had been tagged, and recoveries had been made at West Beach, Skagit Bay and Skagit River, and Fraser River. The fish averaged about 20 pounds each.

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SALMON PLANTED IN KLICKITAT RIVER:

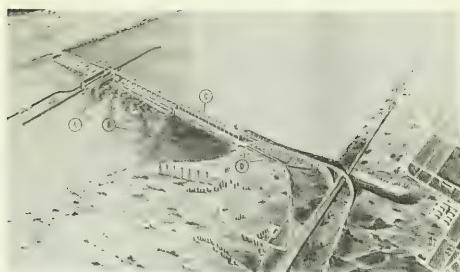
A long-range project to create a run of silver and chinook salmon in the Klickitat River was started in June 1962 by the Washington State Department of Fisheries. Construction of the Castile Falls fishway in 1960 opened up about 30 miles of rich salmon spawning grounds in the upper Klickitat. A plant of 31,300 spring chinook salmon fingerlings was made in the upper Klickitat in August 1961. Additional salmon fingerling plants in the McCormick Meadows area of the river were made on June 21-22, 1962. These consisted of 70,000 large spring chinook salmon from the Wind River; 100,000 silver salmon from the Toutle River; and 50,000 silver salmon from the U. S. Fish and Wildlife Service hatchery at Willard, Wash.

The Washington State Department of Fisheries is carrying out the project with the co-operation of the U. S. Bureau of Indian Affairs, the U. S. Fish and Wildlife Service, and the Yakima Indian tribe. The upper Klickitat is in the Yakima Indian Reservation. The Indian Tribe said they will refrain from fishing in the upper river while runs are established.

* * * * *

SALMON SPAWNING CHANNEL AT MCNARY DAM ON THE COLUMBIA RIVER:

Fall chinook salmon will spawn naturally in a man-made spawning stream, the eggs



Sketch of McNary Dam on the Columbia River showing fishways for the passage of salmon: A, Washington fish ladder; B, entrances; C, powerhouse; D, Oregon fish ladder.

will hatch, and the young fish will grow and migrate. These facts have been learned in the supplemental spawning channel at McNary Dam on the Columbia River, operated since 1957 by the Washington State Department of Fisheries under a contract from the U. S. Army Corps of Engineers. The contract expired on June 30, 1962. The Washington fisheries agency has proposed a one-year renewal of the contract in order to gain more knowledge on this project. The renewal would also produce a maximum number of seaward chinook salmon migrants from the McNary Dam area.

A number of two-year old jack salmon have returned to the channel's discharge stream during the past two years. The Supervisor of Research for Washington State said that the early returns give promise that enough spawners will return to perpetuate the run to the channel. In the fall of 1961, a total of 63 jack salmon returned to the channel from a 1960 release of 55,850 fingerlings which were marked with a right ventral fin clip. The first large group of chinook salmon released from the channel should return in the fall of 1962 as four-year old spawners. The group includes 39,729 salmon from the channel, of which 20,015 were marked, and 100,000 marked Klickitat Hatchery fish released in the channel.

The biologist in charge of the project said the spawning channel has been considerably improved in the light of knowledge and experience gained in the five years of operation. A major addition to the channel in 1961 was the construction of a rearing pond approximately one acre in size. During the 1962 season, the spawning production of salmon

on hatched in the channel will be compared with the young produced at the channel by spawners that were hatched at the Klickitat Hatchery. Live boxes will be used to trap and separate the young produced by each group. When the fish are large enough to handle they will be counted and released into the rearing pond.



Wholesale Prices, July 1962

Stronger market conditions caused by a dip in seasonal landings in New England and a continued good demand for all marine species were responsible for the rise in the July 1962 wholesale price index for edible fishery products to 119.0. From June to July the index rose 0.6 percent, and it was up 14.3 percent from July 1961.

The subgroup index for drawn, dressed, or whole finfish this July rose 7.9 percent from the previous month and was 19.8 percent higher than in July 1961. Compared with June, prices in July were up for all products in this group except Lake Superior whitefish at Chicago. Whitefish prices dropped 13.1 percent from June to July as the supply improved, but they were still 13.1 percent higher than in July 1961. Lake Michigan yellow pike prices at New York City were up 5.6 percent from June to July but dropped 18.1 percent from July 1961. Ex-vessel prices for large haddock at Boston in July were up 65.7 percent from June as a result of lighter landings, and were up 65.2 percent as compared with the same month of 1961. The demand for fresh large haddock was strong because of light landings. From June to July, prices at New York City rose 2.2 percent for fresh western halibut and 1.3 percent for fresh king salmon. Compared with July 1961, prices at New York City this July were 28.5 percent higher for fresh halibut and 12.7 percent higher for fresh king salmon.

From June to July, prices for fresh haddock fillets at Boston were up 23.8 percent despite relatively good landings of small haddock. Fresh shrimp prices at New York City, however, dropped 13.5 percent because of more liberal seasonal supplies from the South Atlantic States. As a result, the processed fresh fish and shellfish index for July dropped 6.0 percent from June, but was up 8.5 percent from July



View of wholesalers' stand on South Street in the salt-water section of Fulton Fish Market.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, July 1962 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes 2/ (1957-59=100)			
			July 1962	June 1962	July 1962	June 1962	May 1962	July 1961
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					119.0	4/118.3	119.4	104.1
Fresh & Frozen Fishery Products:					118.5	4/117.5	118.1	100.4
Drawn, Dressed, or Whole Finfish:					123.3	114.3	119.9	102.9
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.13	.08	98.6	59.5	65.7	59.7
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.45	.44	133.0	130.1	122.2	103.5
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.98	.96	136.2	134.5	139.7	120.8
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.60	.69	89.5	103.0	106.0	79.1
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.48	.45	77.8	73.7	116.3	95.0
Processed, Fresh (Fish & Shellfish):					113.4	5/120.6	119.7	104.5
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.39	.32	94.7	76.5	80.1	70.4
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.90	1.04	105.5	121.9	119.6	84.9
Oysters, shucked, standards	Norfolk	gal.	7.50	7.50	126.5	126.5	126.5	134.9
Processed, Frozen (Fish & Shellfish):					113.3	112.7	110.2	90.6
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.38	98.9	96.3	100.1	97.6
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.34	.33	98.2	96.7	96.7	96.8
Ocean perch, lge., skins on, 1-lb. pkg.	Boston	lb.	.30	.30	103.4	106.1	110.4	98.2
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	1.03	1.03	122.2	122.2	116.8	84.2
Canned Fishery Products:					120.1	120.1	122.1	110.8
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	28.50	28.50	124.2	124.2	124.2	122.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	12.15	12.15	107.9	107.9	107.9	97.7
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	5.25	5.25	118.5	118.5	118.5	101.5
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	11.31	11.31	145.1	145.1	164.3	115.8

1/ Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/ Beginning with January 1962 indexes, the reference base of 1947-49=100 was superseded by the new reference base of 1957-59=100.

3/ Recomputed to be comparable to 1957-59=100 base indexes.

4/ Revisions were minor and did not affect indexes published for June.

5/ Index was unavailable in June.

1961. As compared with the same month in 1961, the subgroup index this July was higher because of substantially higher prices for fresh haddock fillets (up 34.5 percent) and fresh shrimp (up 24.3 percent).

The price index for processed frozen fish and shellfish in July 1962 was up 0.5 percent from the previous month and 25.1 percent higher than a year earlier because of the strong frozen shrimp market at Chicago. Frozen shrimp prices in July remained at the same level as in June, but were up 45.1 percent from July 1961. From June to July prices for frozen flounder fillets rose 2.7 percent and for haddock fillets advanced 1.6 percent, but prices for ocean perch fillets dropped 2.5 percent. Compared with July 1961,

prices this July for ocean perch fillets were up 5.3 percent, and flounder and haddock fillets prices also were up slightly.

Canned fishery products prices were unchanged from June to July but the subgroup index this July was 8.4 percent higher than a year earlier. Compared with July 1961, prices this July were up 1.8 percent for canned pink salmon, up 10.4 percent for canned tuna, up 16.7 percent for California sardines, and up 25.3 percent for Maine sardines. Prices for new-pack Maine sardines remained steady during June-July following the 11.7-percent price drop from May. By the end of July, the canned tuna pack was ahead of the same period last year by 10.8 percent and the canned salmon pack (mostly pinks and chums) was better than expected although still below the 1961 season pack.





FOREIGN

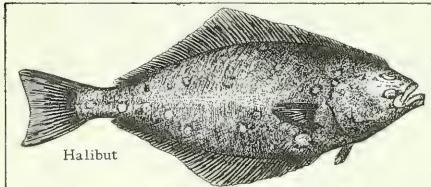
International

INTERNATIONAL PACIFIC HALIBUT COMMISSION

NORTH PACIFIC HALIBUT FISHING IN AREA 3A ENDED AUGUST 11, 1962:

Fishing in Pacific halibut Area 3A ended at 6 p.m. (P.S.T.) on August 11, 1962. The International Pacific Halibut Commission estimated that by August 11 the catch limit of 33 million pounds for Area 3A would be reached. As of July 23, 1962, the landings of halibut from Area 3A were 25.5 million pounds, compared with 23.0 million pounds to July 20, 1961. The Area 3A closure this year was about 12 days earlier than in 1961 when fishing ended on August 23 (6 a.m.). In 1960, fishing in Area 3A stopped on July 25, in 1959 on August 1, and in 1958 on August 31.

Area 3A includes the waters off the coast of Alaska between Cape Spencer and Shumagin Islands. Fishing in Area 3A is ended until reopened in 1963.



Halibut

There has been no announcement as to closure of Area 2 and fishing in that area will continue until the 28.0-million-pound limit has been caught. Halibut landings from Area 2 as of July 23, 1962, totaled 20.0 million pounds, as compared with 21.4 million pounds to July 20, 1961. In 1961, Area 2 closed on September 7; in 1960, Area 2 closed on July 31; and in 1959, Area 2 closed on July 8. The Area 1 fishing season, with no catch limit, will end at the same time as that in Area 2. In 1961 when Area 1 consisted of two areas, that part designated Area 1A was open to fishing to October 1.

The official opening date for all halibut fishing in the North Pacific regulatory areas this year was May 9 (at 6 p.m.) in all areas (Areas 1, 2, and 3A) except in the Bering Sea (Area 3B North) where fishing started on March 28 and in waters west of the Shumagin Islands (Area 3B South) where fishing started on April 19. In Area 3B North fishing will end October 15, and in Area 3B South fishing will end September 30; there is no catch limit for either area.

This year, Area 3A was open to fishing for 94 days--11 days less than the 105 days in 1961. In 1960, the area was open to fishing for 85 days, in 1959 for 92 days, in 1958 for 119 days, and in 1957 for 144 days (the longest season for the area since 1945 when the area was open to fishing for 147 days). Between 1945 and 1955 the trend had been towards a shorter season, but then the trend reversed itself and through 1957 the seasons were longer. Beginning in 1958 the trend was reversed again and the seasons through 1960 became shorter. But the season was longer by 20 days in 1961, and the trend was reversed again with the shorter season this year.

Note: See *Commercial Fisheries Review*, April 1962 p. 37.

FOOD AND AGRICULTURE ORGANIZATION

PROPOSED AGENDA FOR FISHING GEAR CONGRESS IN 1963:

The Second International Fishing Gear Congress under the auspices of the Food and Agriculture Organization (FAO) is to be held at London, England, May 25-31, 1963.

The First draft of the Proposed Agenda follows:

The Second Congress will be organized along lines similar to those of the First Gear Congress in 1957. The 1957 agenda was comprehensive, but it is proposed to limit the 1963 meeting to a few selected topics of maximum interest. Fewer topics will mean more time for discussion of each topic, and strict selection of topics should mean more intense and specific discussion. The main emphasis will again be on recent developments in the industry and on the growth of gear technology.

This first draft of the tentative agenda is designed as a basis for discussion with contacts in industry, research, and government. The Fisheries Division of FAO will appreciate any comments on this draft. Suggestions are needed for deleting or adding items, change of emphasis, etc. Comments are also invited on organizational aspects, duration of the Congress, etc. Tentatively it is envisaged that the Congress would last one working week, Monday through Saturday, with 5 days devoted to discussions and 1 day for an excursion.

I. New Materials and Their Application to Fishing: New synthetic fibers have been developed since the 1957 Congress or have found recent application in fisheries, particularly polyethylene fibers and their admixtures. Other fibers, such as polypropylene, are in an advanced stage of development. These are expected to find commercial application in fisheries in the very near future, possibly before the next Congress is held. Such fibers are expected to have considerable impact, if advance information as to strength weight, and price holds true.

There should be no need to repeat from the First Congress the systematic coverage of

International (Contd.):

characteristics of various net materials and preservation of gear.

Numbering systems for twines might usefully be reviewed again. The Working Group appointed at the First Gear Congress has now prepared a report with recommendations on standardization of numbering systems for netting twines.

Testing methods for gear materials also need to be discussed again. The Working Group appointed at the First Congress has now prepared a report on the various testing methods used in different parts of the world. It is hoped that agreement may be reached on standardization so that test results will be comparable.

Knotless nets were virtually unknown outside Japan four years ago when the First Gear Congress met. Now these nets are finding considerable application in other parts of the world. It might be opportune to discuss and compare the different makes and report on their application in various types of nets (trawls, purse seines, gill nets).

Lines and ropes of novel construction and unconventional materials are appearing on the market. They might perhaps be included on the agenda as a minor item.

Monofilament nets are finding a wider application, even in marine fisheries. It might be useful to discuss their construction and applicability to certain fishing conditions, catchability, etc.

II. Handling of Gear: Stern trawling is still a controversial subject. Until now discussion has been mainly confined to stern trawling with large vessels. The application of this method on smaller craft is also of interest, particularly in view of simpler maneuvering, and the possible saving of labor. Several different stern hauling arrangements are in use. It should be fruitful to discuss the comparative virtues of the various systems under different fishing conditions, with heavy or light gear from different types and sizes of vessels.

Mechanical handling of gill nets and long lines was dealt with rather sketchily at the First Congress. These basic fishing methods continue to be important and in some cases, their importance is increasing. It might be useful to discuss power hauling of bottom-set and drifting nets and lines with various

types of winches and gurdies, grooved sheaves on horizontal axis, either suspended (power block) or fitted on a rigid support. There might also be discussion of deck layouts and for facilitating rapid setting, etc.

III. Gear and Fishing: Certain important gear types, which were passed over lightly at the First Congress, could be discussed under this heading.

Gill nets and tangle nets. Design; methods of framing; effect of hanging-ratio on catchability and selectivity; color; strength in relation to fishing ability, first cost, durability.

Long lines (both bottom-set and drifting) can usefully be described and discussed, particularly the types adapted for mechanized fishing.

IV. Trawling: One-boat midwater trawling is an interesting subject. Many of the people concerned with developing this method feel they are on the threshold of a major breakthrough. However, each developer still seems to have his own special problem. Some have difficulties with depth regulation; some have overcome this problem and have encountered new problems. It would certainly be useful to assemble these persons in one room to solve each others' problems. Quite possibly, the various solutions have already been found in different parts of the world. This forum would help to bring these possible solutions into the open and to the attention of those who need them. Discussions on midwater trawling might come under the following headings: (1) Gear--design and materials of net, floats, kites, boards, warps. (2) Deck gear. (3) Performance--opening size and shape, resistance, maneuverability. (4) Operation (technique)--fish finding, aiming gear (headline transducer, towed "shark," telemeter, etc.), towing speed. (5) Fish Behavior--in relation to gear used. (6) Bottom trawling and off-bottom trawling.

High-opening trawls are of growing interest for catching some pelagic species within a few yards of the bottom. Features of such nets are not known in many parts of the world where they might quite likely find application.

Low and wide-opening trawls--species selectivity of some nets of very low opening may, for instance, be of interest from both the conservation and commercial angles. This may be of growing importance with increasing regulation of fishing in territorial waters.

International (Contd.):

V. Fish Finder With Purse Seines: In recent years a technique has been developed not only for detecting pelagic fish with a fish finder, but also relying on the fish finder indications for guidance in setting one-boat purse seines around the submerged school. This, coupled with the use of extra-deep purse seines, made of strong synthetics and hauled mechanically, has opened up new fisheries. The technique may have far-reaching implications. It seems an effective method of catching schooling fish at considerable depth and under more difficult weather and sea conditions than has previously been feasible with seines. Purse-seining accounts for one-third of the total world catch. Its effectiveness for quantity fishing at low unit cost is unsurpassed. Possible new applications of purse-seining are certainly worthy of careful consideration.

VI. New Ideas: The following items give an indication of some of the subjects that might come up for discussion under this topic: (1) air-bubble curtain fishing; (2) pump fishing (any new developments); (3) acoustical attraction and detection of fish; (4) chemical attractants (artificial bait) and repellants (any new developments); (5) electrical fishing; (6) light attraction with new or conventional gear; (7) fleet operation on distant grounds, including transfer of catch at sea.

Contributions to be presented at the Second Congress are being prepared by fisheries scientists and technologists from many countries. The meeting will be open not only to persons connected with official fisheries services and institutions, but also to interested persons from private industry, and all participants will be free to take part in the discussions. It is expected that copies of papers to be given at the Congress will be distributed in advance of the meeting, so that participants may be prepared to contribute to the discussions, and to the exchange of information and experience.
(Regional Fisheries Attaché, United States Embassy, Copenhagen, October 6, 1961;
Food and Agriculture Organization, Rome.)

GREAT LAKES FISHERY COMMISSION**ANNUAL MEETING:**

The Annual Meeting of the Great Lakes Fishery Commission was held at Ann Arbor, Mich., June 19-20, 1962. The Commission's

meeting was preceded by a meeting of the United States Advisors on June 18. The highlights of the Commission's Annual Meeting were:

1. Reports on sea lamprey reductions in Lake Superior were very encouraging. The take of migrant adult lampreys in 1962 at 29 index barriers amounted to only 13 percent of the number taken in 1961. The population of larval lampreys in streams has been greatly reduced.

2. Lake trout populations in Lake Superior in 1962 continue to show better than 80-percent reduction in occurrence of lamprey wounds. The lake trout caught were larger by 0.3 to 0.8 pounds. Stocks of young lake trout are dominated by planted and marked individuals. Natural recruitment to the stocks is very low as was expected, but survival of larger fish has improved. There has been little or no recruitment for several years. The ban against lake trout fishing in Lake Superior is being effected with only nominal objections from the Great Lake's fishery industry.

3. The Commission was encouraged by the reports of its agents but, due to stringent needs for economy, adopted a budget and program for fiscal year 1964 only modestly above that of the 1963 fiscal year base. Some control work will be done in Lake Michigan but none is scheduled for Lake Huron.

4. Dr. A. L. Pritchard of Ottawa, Canada, was selected as Chairman of the Commission, replacing Claude Ver Duin of the United States Section. Director Donald L. McKernan was named Vice-Chairman. Lester P. Voigt was chosen as Chairman of the United States Section.

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CHEMICAL TREATMENT OF LAKE SUPERIOR STREAMS REDUCES SEA LAMPREY POPULATION:

Sea lamprey catches at Lake Superior barriers were down substantially, the Great Lakes Fishery Commission reported on June 1962, at the University of Michigan, Ann Arbor, Mich. The Commission, which is a United States-Canadian body heading the fight against a predator that has nearly wiped out lake trout populations in the upper Great Lakes, opened its two-day annual meeting with some hopeful statistics.

International (Contd.):

The Commission's chairman reported that with possibly three-quarters of the sea lamprey spawning run over in the United States, and about half over in Canada, the United States catch at assessment barriers was then 6,191 sea lampreys compared to 51,628 in 1961, and that the Canadian catch was 454 compared with 1,555 at the same time the previous year.

The over-all 1962 sea lamprey catch was about 12 percent of the 1961 catch at the same point--an indication that chemical treatment of Lake Superior streams, which was begun in 1958, was beginning to reduce the predator population.

"We can be justifiably pleased and encouraged by these results," the Commission chairman said, "but I must point out that we still must determine whether or not the lampreys have been reduced sufficiently to allow a recovery of the lake trout and re-establishment of that fishery."

"I suggest, therefore, that the Commission, while acknowledging this major accomplishment of its agents, recognize that total success of the control program depends upon the rehabilitation of the lake trout population in Lake Superior. In the meantime, all reasonable measures must be taken to insure that lampreys are reduced further and maintained at a low level."

In line with that goal, the Commission ordered immediate treatment with lampricide of 2 new Lake Superior streams where lamprey populations were reported, and recommended treatment of 6 minor streams with newly-established populations by 1962-63. There are a total of 86 lamprey-producing streams in Lake Superior.

Response to a Commission request that the various Great Lakes States and Province of Ontario limit lake trout fishing in Lake Superior to operations which will provide essential biological information has been "very encouraging," the chairman added.

Agencies studying the fishery reported a decrease in the occurrence of lamprey scars on fish, and an increase in the average size of lake trout caught, both of which are encouraging signs. "Lamprey predations tend to keep down the average fish size by elimi-

nating larger lake trout from the population," the chairman of a special committee on lake trout rehabilitation said. "Recently there has been, for the first time, a significant increase in the size of lake trout taken, suggesting that more trout are being left to grow. Agencies in the United States studying the lake trout fishery also observed a decrease in sea lamprey wounds on lake trout this spring compared to last year," he added.

The latest evidence indicated that natural reproduction of lake trout in Lake Superior has been negligible in recent years, and that the lake trout population is approaching complete dependence on hatchery-raised lake trout. Hatchery fish made up 94 percent of the total 1961 catch of undersized fish by the U.S. Bureau of Commercial Fisheries research vessel Siscowet.

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**CONTRACT-FISHERMEN ONLY TO FISH
LAKE TROUT IN LAKE SUPERIOR:**

A recommendation that commercial landings of lake trout in Lake Superior be restricted to the amount needed for assessment studies by the various research agencies working on the lake, was made by the Great Lakes Fishery Commission at the interim meeting in November 1961. This recommendation was based on evidence presented by the U.S. Bureau of Commercial Fisheries, the Michigan Department of Conservation, the Wisconsin Conservation Department, and the Fisheries Research Board of Canada. The high percentage of hatchery-reared fish (as high as 95 percent in some areas) among the undersize lake trout in the commercial catch supported earlier evidence that natural reproduction has been practically nil for the past few years, and that the fishery faced almost certain collapse. In view of that evidence, and evidence of markedly lower incidence of sea lamprey wounds during the past year, the Commission felt immediate action was necessary in order to expedite the restoration of the lake trout population. Examination of catches made in the spring of 1962 confirmed the scarcity of small trout, and the lower incidence of lamprey wounds. The Michigan Conservation Commission issued the order in April, to close all commercial fishing for lake trout, except for eight fishermen who are under contract to the U.S. Bureau of Commercial Fisheries to provide research information on their restricted catches of lake trout.

International (Contd.):

The eight commercial fishermen contracted by the Bureau are under specific controls to provide minimal numbers of lake trout required to continuously evaluate the status of the lake trout population in Lake Superior. The restricted commercial fishing will yield: (1) information on the incidence of sea lamprey scars and wounds; (2) length, sex, and age composition of fish caught; (3) numbers of planted fish caught; and (4) the catch per unit of effort (10,000 feet of gill net) in standard commercial gear. These data will be compared with similar records taken by the same eight fishermen in previous years to evaluate the current status of the population and the success of hatchery plantings.

The contract-fishermen will fish only during the months for which comparable data are available from previous years. The total catch of lake trout in Michigan waters will be limited to 25,000 pounds during the balance of 1962. Amounts needed for research purposes in future years will be determined by administrative and research agencies concerned with Lake Superior.

After collection of data for the U.S. Bureau of Commercial Fisheries, the contractor may keep or sell all lake trout of legal size which he has caught. All live lake trout of illegal size shall be returned to the water at the time of capture. Dead, undersize fish shall be surrendered to a conservation officer who will be charged with turning them over to an institution for use in feeding inmates.

Contract fishing will be closed during the October-November lake trout spawning season.

Commercial fishermen who are scheduled to fish for lake trout for the assessment studies are: Tom Brown, Whitefish Point; Falk Brothers, Skanee; Robert Kaliainen, Chassell; Arthur Kolehmainen, Chassell; Arthur Lasanen and Son, Lake Linden; Francis Thill, Marquette; William Tornovich, Grand Marais; and Jerome Van Landschoot, Munising.

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LAKE TROUT CATCHES IN LAKE SUPERIOR RESTRICTED TO QUOTAS:

Because of the rapid decline in lake trout stocks in Lake Superior due to sea lamprey

depredations, Canada and the United States have agreed to restrict the 1962 commercial lake trout catch to only the amount needed by scientists of each country for their studies. The restriction was recommended by the Great Lakes Fishery Commission made up of representatives from both countries.

In a letter to Lake Superior commercial fishermen, the Ontario Lands and Forests Minister said: "It is apparent that, due to the seriousness of the situation, we can only agree. As a result, catch quotas for 1962 have been set at 60,000 pounds from United States waters and 44,000 pounds from Canadian waters."

The steady decline in the lake trout fishery in Lake Superior due to the sea lamprey is indicated in Canada's Lake Superior lake trout landings data for the past ten years. From 1,389,000 pounds in 1952, landings dropped to 1,371,000 pounds in 1953, 1,266,000 pounds in 1954, 1,003,000 pounds in 1955, 527,000 pounds in 1956, 324,000 pounds in 1957, 366,000 pounds in 1958, 238,000 pounds in 1959, and 122,000 pounds in 1960. In 1961, Canada's Lake Superior lake trout landings were estimated to be down to only 44,000 pounds. In United States waters, the decline was from 2,838,000 pounds in 1952 to an estimated 298,000 pounds in 1961.

INTERNATIONAL ASSOCIATION OF FISH MEAL MANUFACTURERS**THIRD ANNUAL CONFERENCE:**

The Third Annual Conference of the International Association of Fish Meal Manufacturers will be held at the Mayfair Hotel, London, England, October 9-12, 1962. The Conference will be longer than the two previous conferences. Members of the Scientific Committee will have a full day's pre-meeting discussion on the many scientific and technical subjects which concern the Association. It will also allow the meeting to consider the increasing number of topics in which the Association is actively interested. A special session is to be held for delegates, including leading world industry manufacturers and scientists, to discuss problems of mutual interest with brokers, agents, and importers principally dealing with fish meal.

The Conference will be hosted by the United Kingdom Association of Fish Meal Manufacturers which had a leading role in sponsoring and organizing international fish meal conferences before the formation of the International Association, and in the formation of the United Kingdom Association.

International (Contd.):

The International Associations' main aim and activity is devoted towards cooperation, thereby assisting world fish meal manufacturers to open and develop wider outlets for fish meal in all its forms in both developed and underdeveloped markets, thus enabling this valuable product to play an even greater part in animal and human nutrition.

To this end, manufacturers and scientists connected with the industry undertake a full exchange of information by means of meetings. In 1961 such meetings were held in Hamburg, Bergen, and Paris; also by issuance of a News Summary, and in other ways to improve methods of manufacture and preservation of meal, quality standards, methods of analysis, knowledge of nutritional requirements, and to supply the answers to many other technical and nutritional problems. During the year, a brochure on the use of fish meal was prepared in English, French, and Spanish, which can be used with appropriate additional chapters adapted to local conditions to make its value known in less highly-developed agricultural countries, or in developed countries which now use comparatively little fish meal. Collaborative feeding trials were recently made simultaneously in several countries, and the results were pooled for the common benefit of the industry.

The Association has been actively collaborating and exchanging information with an increasing number of international organizations in connection with statistical information on fish meal, fish flour for human consumption, and with an expert committee of the European Economic Community (EEC) on the question of analytical methods, and similar problems. The Association also cooperates closely with the Fish Meal Exporters Association in FEO's activities relating to establishment of wider markets, exchange of statistics, and similar matters concerned with the promotion of fish meal. All those and other problems will receive detailed scientific and commercial consideration at the Third Annual Conference.

Members of the Association are the manufacturers' associations or individual manufacturers in Belgium, Canada, Denmark, France, Germany, Holland, Iceland, Morocco, Norway, Peru, Portugal (including the Overseas Province of Angola), Spain, South Africa, Sweden, United States, and United Kingdom.

Observers have been invited to attend the Conference from Japan and Chile, the remaining major producers who are not yet members, as well as from the Food and Agriculture Organization (FAO) and the Bureau of Commercial Fisheries, U.S. Department of the Interior.

ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT

SUBSIDIES AND PROGRAM FOR 1963 DISCUSSED BY FISHERIES COMMITTEE:

The fourth session of the Fisheries Committee of the Organization for Economic Cooperation and Development (OECD), held in Paris, France, on July 9-10, 1962, was attended by nearly all of the 20 member countries and by representatives of the Food and Agriculture Organization (FAO), and the European Economic Community (Common Market).

The principal topics for discussion on the agenda of the meeting were: (1) a review of papers on the fishery subsidies provided by the various OECD countries, and (2) the operational program and budget for the calendar year 1963. Subsidy reports for seven member countries were reviewed, modified, and approved. When the reports on all countries have been cleared, they will be combined to form a complete documentation on the subsidies to fisheries in the OECD countries. The Committee also reviewed the progress in the draft report on the market for canned fish in OECD countries, which is scheduled for completion in the near future.

The projects proposed for the calendar year 1963 include the following:

1. Promotion of uniform quality standards for frozen fish.
2. Study of the establishment of a fishery market newstype service in the European countries.
3. Simplification and coordination of sanitary regulations affecting international trade.
4. Economic factors concerned with the rational exploitation of maritime resources.
5. Detailed nomenclature of the different species and varieties of sea products.

The next meeting of the OECD Fisheries Committee is tentatively scheduled for the first part of October 1962.

Note: See Commercial Fisheries Review, August 1962 p. 55.

International (Contd.):

**UNESCO INTERGOVERNMENTAL
OCEANOGRAPHIC COMMISSION**

**ARABIAN SEA PLANS OF INDIAN OCEAN
EXPEDITION COORDINATED:**

A working meeting on the coordination of operating plans for the Arabian Sea phase of the UNESCO Indian Ocean oceanographic expedition was held in Wormley, England, July 9-11, 1962. The meeting was attended by a group of United States representatives headed by John Lyman, Associate Program Director for Earth Sciences (Oceanography), National Science Foundation, Washington, D.C. The Foundation has been named by the President as coordinator for the United States Government participation in the Expedition.

At its first session (October 1961), the UNESCO Intergovernmental Oceanographic Commission adopted a resolution which commended the International Indian Ocean Expedition to its members for possible participation, and instructed the Secretary of the Commission to assume such coordinating functions as could be worked out with the Scientific Committee on Oceanic Research (SCOR) and other appropriate bodies. SCOR in April 1962 transferred formal responsibility and authority for coordination of the Expedition to the Secretary of the Commission.

The working meeting concerned itself with the coordination of scientific programs involving oceanographic study of the Arabian Sea.

The agenda, as approved by the Meeting follows:

1. Work already done and its results.
2. Existing cruise plans for the Arabian Sea.
3. Coordinating requirements for synoptic work:
 - (a) Time and space adjustment of cruise tracks;
 - (b) Coordination of volume, nature, and methods of measurements to be done;
 - (c) Standardization and intercalibration requirements;
 - (d) Reference stations;
 - (e) Use of underwater cables and buoys.
4. Meteorological problems.

5. Tide gauges.

6. Logistics, e.g. port facilities, explosives, communications, exchange of data, and people, etc.

Besides those from the United States, the Working Meeting was attended by participants from France, German Federal Republic, India, Pakistan, South Africa Republic, United Kingdom, and UNESCO's Intergovernmental Oceanographic Commission.

At the beginning of the meeting it was decided to enlarge the area to be covered by the discussion from the originally planned Arabian Sea region to the whole North-Western Indian Ocean including the Arabian Sea and the part of the open ocean south of it to 10° S. latitude. It was done with understanding of the importance of interregional coordination and of the necessity of some geographical overlap between the regions to be covered by all four coordinating working groups. Some of the water movements and other physical and biological processes must be followed from one region to the other.

Note: See *Commercial Fisheries Review*, July 1962 p. 51, June 1962 p. 46.

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**WORKING GROUPS ON COMMUNICATIONS
AND FIXED STATIONS MEET IN PARIS:**

Two Working Groups of the UNESCO Intergovernmental Oceanographic Commission, one on Communications, and the other on Fixed Stations met in Paris, France, August 6-10, 1962. The two Working Groups studied various matters relating to communications and fixed stations, particularly the establishment of oceanographic communication requirements, and the legal status of manned and unmanned buoys.

The United States was a prime force in the establishment of the Intergovernmental Oceanographic Commission and has considerable interest in the work being done by the two groups which met for the first time.

The meetings of both Working Groups were attended by United States representatives; the meeting on Communications by a representative from the Scripps Institute of Oceanography, La Jolla, Calif., and on Fixed Stations by a representative of the Woods Hole Oceanographic Institute, Woods Hole, Mass., and an adviser from the Weather Bureau, Marine Observation Section, U.S. Department of Commerce.

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International (Contd.):

GROUP OF EXPERTS ON OCEANOGRAPHIC DATA EXCHANGE MEETS IN WASHINGTON:

A Group of Experts on Oceanographic Data Exchange, UNESCO Intergovernmental Oceanographic Commission, met in Washington, D.C., August 7-10, 1962. The meeting was held at the National Oceanographic Data Center and concerned the organization of data exchanges.

The Oceanographic Commission recommended the establishment of this Group at its first session held in October 1961.

United States members of the Group attending the meeting were from the National Oceanographic Data Center, the U.S. Bureau of Commercial Fisheries, and Coast and Geodetic Survey, U.S. Department of Commerce.

INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION

SCIENTIFIC COMMITTEE MEETS IN HONOLULU:

A meeting of the Scientific Committee, International North Pacific Fisheries Commission, held at Honolulu, August 8-12, 1962, concerned itself with preparations for the Interim Meeting of the Commission, which was scheduled to convene at Honolulu, August 13, 1962. The Committee meeting was attended by a representative of the U.S. Bureau of Commercial Fisheries.

WHALE OIL

PRICES DECLINE:

According to sources from London, England, a sale of 60,000 long tons of whale oil was made some time during July 1962 at £45 (about US\$126) per long ton (about 5.6 U.S. cents a pound) ex-tanker Rotterdam, which was the lowest price in some years. The quantity was made up of British, Japanese, and Dutch oil.

A previous sale of 50,000 tons of Antarctic whale oil at £50 (about US\$141) per long ton (about 6.3 U.S. cents a pound) had been made about two months previous to July 1962. The lower price was the result of the steady decline in prices for competitive vegetable and fish oils.

Note: See *Commercial Fisheries Review*, August 1962 p. 85.

FISH MEAL

WORLD PRODUCTION, MAY 1962:

According to preliminary data from the International Association of Fish Meal Manufacturers, world production

of fish meal in May 1962 amounted to about 232,755 metric tons, an increase of 25.7 percent over world production in May 1961.

Most of the principal countries producing fish meal submit data to the Association monthly (see table).

Country	World Fish-Meal Production by Countries, May 1962		
	May		Jan.-May 1962
	1962	1961	
....(Metric Tons)....			
Canada	2,376	1,643	35,808
Denmark	8,424	5,315	28,229
France	1,100	1,100	5,500
German Federal Republic	5,485	4,980	32,264
Netherlands	1/	500	1/1,600
Spain	2,578	1,339	11,476
Sweden	459	270	2,329
United Kingdom	6,939	6,353	30,861
United States	38,433	31,242	50,772
Angola	1/	6,363	1/10,442
Iceland	9,661	5,106	26,930
Norway	3,822	12,311	19,945
Peru	121,533	80,784	460,623
South Africa (including South-West Africa)	31,945	27,800	134,596
Total	232,755	185,106	851,375

^{1/}Data not available for May; data available only for January-April 1962.

Note: Belgium, Chile, Japan, and Morocco do not report their fish-meal production to the International Association of Fish Meal Manufacturers at present.

The increase in world fish-meal production in May 1962 was mainly due to increased output in Peru (up 50.4 percent), the United States (up 23.0 percent), Iceland (up 89.2 percent), South Africa (up 14.9 percent), and Denmark (up 58.5 percent).

This year to date Peru had increased landings of anchoveta; menhaden landings in the United States, especially on the Atlantic Coast, were up; Iceland's landings of herring were up; South Africa's pilchard landings were higher; and Denmark's landings of industrial fish were up. The increase was partly offset by a sharp drop in fish-meal production in Norway because of the failure of this year's herring fishery. Peru accounted for 52.3 percent of world production (for countries listed) in May 1962, and the combined production of Peru, the United States, and South Africa accounted for 82.5 percent of total production this May.

During the first five months of 1962, world fish-meal production for the countries listed was 851,375 tons. Peru accounted for 54.1 percent of total production during that period followed by South Africa with 15.8 percent, and the United States with 6.0 percent.

INTERNATIONAL WHALING COMMISSION

FOURTEENTH ANNUAL MEETING:

Scientists attending the Fourteenth Annual Meeting of the International Whaling Commission at London, England, June 25 to July 6, 1962, generally agreed that the whale resources of the world are in very poor condition. If the Commission does not act almost immediately, it seemed clear that the situation would continue to deteriorate.

The meeting was attended by representatives from Argentina, Australia, Canada, Denmark, France, Iceland, Japan, Mexico, the Netherlands, New Zealand, Norway, South Africa, Sweden, the United Kingdom, the

International (Contd.):

United States, and the Union of Soviet Socialist Republics. In addition, observers were present from the Food and Agriculture Organization (FAO), the International Council for the Exploration of the Sea, Chile, and Italy. The first week was occupied by meetings of the Scientific Committee, and the second week by plenaries and other Commission committees.

In 1961, the Commission appointed a special committee of experts to study the extensive scientific data that are available. For various reasons, the work of this special committee did not proceed very rapidly in the past year. Funds now have been provided and it is expected that this committee will complete its work and submit its report in time for the Fifteenth Annual Meeting in June 1963. The Commission did not take positive action at the 1962 meeting, preferring to await completion of the special committee's report.

The return to the Commission of the Netherlands as a participating Government was considered significant. The consequences of this, and of the agreement made outside the Convention by the five Antarctic pelagic whaling countries for sharing the pelagic catch in the Antarctic were most important, as outlined in the opening speech by the United Kingdom representative. He pointed out that now that the agreement on catch-sharing had been reached, he hoped it would be possible to limit the Antarctic catch to the level which the stocks are able to bear. He considered the special scientific investigations on the condition of the Antarctic stocks, shortly to be undertaken, to be of vital significance, and hoped that the meeting would agree on the details of the International Observer Scheme.

In carrying out its principles, the Commission has limited the annual catch of Antarctic pelagic whales by blue-whale units each season. (A blue-whale unit equals one blue whale, or two fin whales, or two and a half humpback whales, or six sei whales). At the time of the Twelfth Meeting in June 1960, this limit had been 15,000 units but it was then suspended for two seasons for the four countries remaining in the Convention, with the exception of Japan and the U.S.S.R. who had objected to the suspension. No change in this over-all limit was suggested at the

1962 meeting so that it returns to 15,000 units again for the 1962/63 season. During the last Antarctic whaling season, when the over-all limit was still suspended, the Antarctic pelagic whaling countries had imposed on themselves the following voluntary limits: Norway 5,100 Netherlands 1,200, U.S.S.R. 3,000, Japan 6,680, and United Kingdom 1,800 units.

During the 1961/62 season, 21 expeditions operated in the Antarctic (7 Norwegian, 7 Japanese, 4 Soviet, 2 British and 1 Dutch) and caught a total of 15,253 blue-whale units. The number of whales in the total baleen catch was 1,118 blue whales, 26,438 fin whales, 309 humpbacks, and 4,749 sei whales. The total baleen catch in the 1960/61 season had amounted to 16,433 blue-whale units (1,740 blue whales, 27,374 fin whales, 718 humpbacks, and 4,310 sei whales). A total of 4,864 sperm whales were also taken by pelagic expeditions in the Antarctic compared with 4,681 sperm whales in 1960/61. The production of baleen and sperm oil in 1961/62 amounted to 2,005,087 barrels (6 barrels to the ton); in the previous season it was 2,123,571 barrels.

Only one Antarctic land station, at South Georgia, was operating in the 1961/62 season. A total of 1,194 whales were caught and 49,815 barrels of oil (baleen and sperm) produced. In the previous season when two companies were operating from three land stations the total catch of whales amounted to 2,317 and total oil production to 109,727 barrels.

Outside the Antarctic, 46 land stations and 3 floating factories were in operation in 1961. A total of 22,195 whales were caught compared with 24,313 in 1960. Total oil production, baleen and sperm, amounted to 646,676 barrels compared with 724,707 barrels in 1961.

The Commission considered the position of the former sanctuary in the Antarctic (the waters south of 40° south latitude from 70° west longitude westwards as far as 160° west longitude) for baleen whales against pelagic whaling operations. Since 1955 this area has been open to pelagic operations by decisions taken at previous meetings of the Commission. On the last occasion that this matter was considered by the Commission, in 1959, it was agreed that the sanctuary should remain open for a further three years, until November 8, 1962. At their Fourteenth Meeting, the Commission decided that it would be undesirable to close the Sanctuary again at this stage since

International (Contd.):

it might result in increased catching in other more heavily hunted areas. It was therefore agreed that the former sanctuary should remain open "until the Commission otherwise decided" and that the relevant paragraph of the Schedule to the Convention should be amended accordingly.

The Commission made no change in the length of the open season for Antarctic pelagic whaling which remains from December 12 to April 7.

At their 1960 meeting, the Commission altered the opening date for the taking of blue whales from February 1 to 14 and adopted measures for the further protection of humpback whales in closing Antarctic Area IV to humpback whaling by pelagic expeditions until the end of 1963 and by reducing during the same period the catching season in Antarctic Area V from 4 to 3 days starting on January 20. Because objections to these measures were subsequently lodged and not withdrawn by the member Antarctic pelagic whaling countries (Japan, Norway, the United Kingdom, and the Soviet Union), the measures were not effective during the 1960/61 and 1961/62 season. At their Fourteenth Meeting the Commission adopted a resolution calling upon those countries to reconsider their objections in view of the deteriorating position of the stocks of blue and humpback whales. At the same time, however, the Commission recognized that the Netherlands, who was not a member of the Commission when the measures were adopted, should be placed on the same footing as the other Antarctic pelagic whaling countries. A further resolution was therefore passed by which the Netherlands is enabled, if it so wishes, to register objections to the blue whale and humpback measures within 90 days from the date of their re-accession to the Convention on May 4, 1962.

Discussions on the setting up of an international inspection system of Antarctic pelagic factory ships were held during the meeting. No decisions were reached but the Commission is to convene a further meeting on this subject between the five Antarctic pelagic whaling countries. It was expected that this meeting would be held before the end of August 1962.

As a result of the recommendation of the Committee of Three Scientists and the Spe-

cial Scientific Committee with which they worked, the preparation of data to allow a proper appraisal of the stocks of whales in the Antarctic was completed by the national research units. It was hoped that at this meeting it would be possible to formulate in a precise way the state of some of the stocks of Antarctic whales and to see at what level the annual catch should be maintained so as to obtain the best yield. In view of a later meeting to be held by these special committees, there was no disposition at the Fourteenth Meeting to take any regulatory measures such as the complete restriction of the blue whale catch that the Scientific Committee advocated.

In view of a Japanese proposal to reduce the minimum size of sperm whales delivered to land stations in the Northwest Pacific, or over a wider area to 33 feet, the Scientific Committee was asked to undertake further study of evidence on the effect of reducing the minimum size of sperm whales both for land stations and factoryships in the North Pacific and elsewhere. A working group already set up to study the North Pacific whale stocks would be asked to do this task. (International Whaling Commission, London, England, July 7, 1962.)

Note: See Commercial Fisheries Review, Aug. 1962 p. 12.

EUROPEAN ECONOMIC COMMUNITY

CANNED SALMON IMPORT DUTY RATE LOWERED:

A lower canned salmon duty rate of 16 percent ad valorem was granted by the European Common Market on canned salmon imports from all members of the General Agreement on Trade and Tariffs (GATT) including the United States. The original duty rate fixed by the European Economic Community (EEC) was 20 percent. As a result of negotiations between EEC and the United States at the GATT meetings held in 1961, the duty was reduced from 20 percent to 18 percent. Canada, which had also negotiated with the Common Market on the canned salmon duty rate, claimed that a 16 percent rate had been promised. A review of the EEC-Canadian negotiations substantiated Canada's claim, and the rate was reduced to 16 percent.



Aden

UNITED STATES VESSEL TO FISH SPINY LOBSTERS OFF COAST:

A United States importing firm was making preparations in June 1962 to bring a 60-foot refrigerated fishing vessel to Aden to fish commercially for spiny lobsters along that Protectorate's coast. Fishing operations were scheduled to begin some time during the fall after the southwest monsoon season was over. The spiny lobster tails will all be for export to the United States.

The vessel, which is the first of its type in that region, will operate in the Mukalla area. It has a refrigerated holding capacity of 10 tons of spiny lobsters or lobster tails. It is expected that a 300-ton cold-storage plant will be completed by November in that area, and the United States firm has an option on space in the plant. The vessel will be capable of bringing in 10 tons of spiny lobster tails each trip for storage in the cold-storage plant, awaiting shipment to the United States. The enterprise depends on com-



pletion of the cold-storage plant. Meanwhile, the United States importing firm has an option on space in a smaller 60-ton cold-storage plant which is also being planned for Mukalla.

The Aden fishing industry has been in a state of uncertainty for several years, but has finally started moving forward. A representative of the United States importing

firm visited Aden at the invitation of that country's Marketing Department. He saw that spiny lobster fishing there looked promising, and negotiated for a United States vessel to fish the resource. The vessel was expected to arrive at Aden by the end of July. (United States Consulate, Aden, July 12, 1962.)



Angola

NEW FISH PROCESSING PLANT OPENED:

A new fish-processing factory opened on June 19, 1962, according to a report in the *Diario de Luanda*, June 11, 1962. The new factory is located at Equimina Bay, about 86 miles south of the city of Benguela. It will can, freeze, and dry fish as well as manufacture fish meal. It will also operate its own fishing fleet. No information is available as to the amount of the investment involved. (United States Consulate, Luanda, June 28, 1962.)

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TRAWLING REGULATED:

Portuguese Government regulations governing the type, equipment, and operations of trawlers fishing in Angolan waters were enacted by Decree No. 44,398, published in the *Diario do Governo*, in mid-1962.

The Angolan fishing industry recently acquired its first trawler. This decree may mean that additional trawlers will be added to the Angolan fishing fleet as part of general measures to improve the antiquated status of Angola's fishing industry. (United States Consulate, Luanda, June 28, 1962.)



Australia

SHRIMP FARMING EXPERIMENTS SHOW PROMISE:

An attempt to mass-breed shrimp in captivity is being made by a group of Australians. They hope to show that large-scale shrimp farming on a sound economic basis is possible along a vast stretch of the eastern Australian coast. Although the effort is still in an experimental stage, the indications are that it will be successful.

Australia (Contd.):

One of the group started his shrimp investigations in 1953, when employed by the Fisheries Department of the New South Wales Government. He already knew of one species of shrimp that bred in enclosed waters. This is the greasy back (Metapenaeus mastersii), a shrimp found only in Australia, that breeds freely in estuaries and lakes on the east coast from southern New South Wales to central Queensland.

Another of the Australian group became interested in the prospects of shrimp farming in Australia while serving with the Australian Forces in Japan. There he visited the Hiroshima district where he inspected a farm in which trapped offshore shrimp were fattened in several ponds of 2-3 acres in extent. With the idea of following the Japanese system, he leased a large section of mangrove swamp at Taren Point, on a southern fringe of Great Sydney, an area in Botany Bay, close to the estuary of the Georges River. Two ponds were dug, each measuring 75 feet by 40 feet and 5 feet deep.

In November 1958, 300 pairs of breeding shrimp were obtained from Lake Macquarie, about 65 miles north of Sydney, and released in the ponds. During the following weeks, the stock was breeding prolifically, and before long, several hundreds of thousands of young shrimp populated the ponds. Soon they were between a quarter and a half-inch long.

At this stage they had shed their shells many times as they developed into demersal creatures easily recognizable as shrimp. Their diet slowly underwent the usual change from herbivorous to omnivorous, and on to carnivorous as they became adults. The natural available food in the ponds was supplemented with chopped liver and crayfish meal.

Because of lack of scientific knowledge, plus ignorance of the food requirements of the rapidly growing young, the mortality rate was extremely high. The oxygen in the water became depleted and the shrimp died by hundreds of thousands. One pond was opened to the sea and many of the still-living shrimp left for the bay. But many stayed on, reaching full maturity once the pressure had been removed from the food and oxygen resources. Some shrimp also reached maturity in the fully enclosed pond. These facts made it

clear that shrimp farming was possible but it was obvious that the two original ponds were not big enough for the populations they were called on to support.

Later a shallow tide-fed estuarine pond was provided covering an area of 10 acres, and rich in weed and both animal and vegetable plankton. Stocking of the pond began on September 6, 1960, and small quantities of breeding shrimp were periodically released until the end of the year. Altogether, 900 pairs of migrant shrimp were introduced into the pond. Early in 1961, microscopic examination of water samples showed the presence of large numbers of shrimp larvae. A little later hundreds of thousands of young, each measuring about a quarter-inch long, had developed to the demersal stage. Subsequent investigations revealed a huge population of healthy young shrimp growing to adulthood.

The group was confident that the experiment would prove to be a great success. But an unknown factor then became evident. When an assessment of part of the pond was made in August 1961, it was found that the population had only tripled itself. Earlier indications had been that the original population would have multiplied several thousand times. Seeking a reason for this devastating result, the experimenters came to the conclusion that water pollution from chemical and other factory waste had probably caused the enormous mortality in the pond. Sufficient results were achieved, however, to convince the group that true shrimp farming was filled with the best of prospects.

One of the group said, that the number of shrimp that can be raised in ponds of given sizes is one of the vital facts they are trying to establish. It is known that a female is capable of spawning twice a season at the rate of about 250,000 eggs each time. As with all animals of high fecundity, the mortality is enormous, but from 5,000 to 10,000 eggs may develop into individuals. It is not known yet what order of population will emerge under the conditions in the pool. Mortality may be higher or lower than elsewhere. It may also be hard to maintain food supplies. Shrimp need different diets at different times of their lives. The young are plankton-eating vegetarians. It is therefore necessary to increase the productivity of plankton in enclosed ponds and this calls for complex procedures, including the use of fertilizers. As the growing shrimp pass through the omnivorous stage to become almost entirely carnivorous,

Australia (Contd.):

more prepared foods such as liver meal will have to be used. The successful use of this system of feeding on a commercial scale can be decided only by experiment.

The Australian group sees farming as a means of filling a gap in the existing Australian shrimp industry.

One of the group said today's harvest by the usual means depends to a great extent on weather and other conditions outside the control of fishermen. Supplies, as a result, vary greatly. Glut and scarcity follow each other in a monotonous cycle. Shrimp farming would play a major role in stabilizing the industry. Harvests could be gathered when shrimp from the usual sources are scarce. (World Fishing, April 1962.)

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**SOUTHERN WEST AUSTRALIA
TUNA SURVEY RESULTS:**

A spotting plane was used by the Australian chartered tuna survey vessel Estelle Star to locate schools of fish. No tuna were sighted by the spotting plane on the first six flights (May 7-9) which covered the Albany area and Cape Naturaliste to Jurien Bay. Another series of flights over a three-day period were planned for May, two series were scheduled for June, and another two series for July.

The survey of tuna resources in southern West Australia began in August 1961. It is being carried out by the Fisheries Division, Department of Primary Industry, in association with CSIRO Division of Fisheries and Oceanography.

When it was announced that a spotting plane would be used in the survey, Australia's Minister for Primary Industry said funds for that purpose had been made available from the Fisheries Development Trust Account which was also financing the survey by the Estelle Star.

The Minister said it was possible for spotters to identify the fish from a height of about 1,000 feet. The aircraft would make sweeps of the area in which the Estelle Star was to work each two weeks at new moon and full moon because those were the times when tuna were most likely to be near the surface.

The spotting plane is a twin-engined Aero 145, with cruising speed of 160 m.p.h. and range of 800 miles. It has cabin accommodations for three in addition to the pilot.

The vessel's operations out of Albany from April 13 through May 10, 1962, yielded catches of southern bluefin tuna by trolling on six days in April. A total of 90 tuna were caught, mostly in the Bald Head area, of which 70 were tagged and released. In May, on seven days from May 1-May 10, a total of 280 tuna were caught with pole-and-line and 351 were trolled; a total of 631 fish (all southern bluefin). Of that total, 566 were tagged and released. Most of the fish were caught off Bald Head.

The best day was May 8 when the vessel in the area between Bald Head to Cave Head caught 250 tuna--157 with pole-and-line and 93 by trolling. Most of the fish were caught 50 yards off Bald Head. Of the total caught that day, 230 were tagged and released. (Australian Fisheries Newsletter, June 1962.)

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TUNA FISHERY TRENDS, 1962:

A record 3,715 short tons of tuna was landed during South Australia's 1962 tuna fishing season which ended May 26, 1962. Most of the catch was for the South Australian Fishermen's Cooperative, and the balance for a cannery at Eden in New South Wales. The 1961 season's catch was 2,480 tons.

The New South Wales 1961/62 season was disappointing. Bad weather was responsible for the light tuna landings of 1,737 tons, compared with 2,363 tons the previous season.

The 1961/62 season tuna landings for South Australia and New South Wales combined totaled 5,452 tons, compared with 4,844 tons landed during the 1960/61 season. The tuna fishery in other Australian states is minor. (Australian Fisheries Newsletter, July 1962.)

**British Guiana****SHRIMP EXPORTS, 1961:**

British Guiana's shrimp exports in 1961 totaled almost 4.2 million pounds, valued at W.I.\$2.7 million (US\$1.6 million) f.o.b. point of export. The United States received 90.2 percent of British Guiana's total shrimp exports in 1961.

British Guiana (Contd.):

British Guiana's Shrimp Exports in 1961 by Countries			
Destination	Quantity	Value	
	Pounds	W.I.\$	U.S.\$
United States . . .	3,674,832	2,388,559	1,393,318
United Kingdom . .	282,450	213,668	124,638
Trinidad	177,450	115,494	67,371
Other countries . .	35,468	23,278	13,579
Total	4,170,200	2,740,999	1,598,906

Note: One W.I. dollar equals about 58.333 U.S. cents.
Source: Department of Customs and Excise, Georgetown, British Guiana.



Canada

ARCTIC CHAR FISHERY:

Eskimo fishermen expect to market 100,000 pounds of Arctic char during 1962. This specialty product, almost unknown outside the arctic only four years ago, is now distributed in many parts of Canada. It was introduced to British housewives in June 1962 when a firm in London, England, imported 10,000 pounds. Arctic char, or "ilkalupik" as the fish is known to the Eskimos, has a pink meat. It can be prepared like salmon or trout, but it has its own distinctive flavor.

The commercial fishery for Arctic char was started in Frobisher Bay in the eastern Arctic in 1958, following popular acceptance of a trial shipment to Montreal, Canada. Fish-freezing facilities were installed at Frobisher Bay before the start of the 1959 season. The char run is short and a year's harvest must be caught, frozen, and packed during a month or six weeks. An annual fishery quota of 12,000 pounds was established for the Frobisher Bay fishery.

Other fishery stations were soon needed to meet the demand for this new product. A study by the Arctic unit of the Canadian Research Board showed that prospects were promising for a commercial char fishery at George River in northern Quebec. In this remote part of Canada, some 100 Eskimos were eking out a living off the land. None had ever worked in a commercial fishing operation, but in 1959, with the aid of officials from the Canadian Department of Northern Affairs they established a small fishery cooperative. The Canadian Government then provided a loan for the purchase of supplies and fish-processing equipment and with a tentative quota of 30,000 pounds of char set for the season, the first Eskimo fishermen's

cooperative began operating. Cooperatives were later established at Port Burwell in the eastern Arctic, and at Fort Chimo and Cambridge Bay on Victoria Island in the central Arctic.

At Frobisher Bay, the entire catch is now marketed locally. The Cambridge Bay fishery is Canada's most northerly fishing center, and the char catch from there is used to supply the western part of Canada.

The growth of the cooperatives has enabled the Eskimos to harvest resources that for years had been without economic benefit to them. The point has been reached where the Eskimos are running the enterprises themselves, and the financial returns have had a marked effect on their general standard of living.

Up to the beginning of 1962, a total of 107,000 pounds of Arctic char had been produced by the cooperatives; the production for 1962 has been set at 100,000 pounds--an increase of 100 percent over the previous year's production. (Fish Trades Gazette, June 23, 1962.)

Note: See Commercial Fisheries Review, July 1960 p. 53.

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NEW PRODUCTS BEING DEVELOPED FROM UNDERUTILIZED FRESH-WATER FISH SPECIES:

Some people believe that fish stocks in the Great Lakes are depleted, but that is not so, according to the Chief of the London Ontario Technological Unit of the Fisheries Research Board of Canada. In an interview, he went on to explain that what really has happened is that there has been a change in fish populations in the Great Lakes. There has been a decline in lake trout and whitefish populations, but an increase in underutilized species, or so-called "trash" fish, which presently find very limited markets.

According to recent surveys made in the United States, 30 to 40 percent of the food products sold are products which were not on the market 10 years ago. New products, especially the fully-prepared and partially-prepared convenience foods, are opening new markets for food processors in Canada and in the United States.

One great, underdeveloped food resource is the Canadian inland fisheries. Ontario's Great Lakes and many lakes of the Prairie Provinces contain living silver which fish processors with initiative could convert to gold. Perhaps the reason they are not doing so is because they are not yet aware of the possibilities.

Underutilized Fresh-Water Fish Species: Lake Erie contains more species of game fish, commercial fish, and potentially commercial fish, than any other body of water in Ontario. In recent years the dominant species in the catch from that lake has varied through

Canada (Contd.):

whitefish, blue pike, yellow pike, and yellow perch, to smelt.

When the smelt first appeared in Lake Erie, they were considered a nuisance by the fishermen. There was little or no market for them and economical means of fishing them had not then been devised. But when they became so abundant that they clogged up nets set for other fish, steps had to be taken. Suitable smelt fishing gear was developed and gradually a year-round market for fresh, frozen, and processed smelt was built up. At the present time the consumer market absorbs about 15 million pounds of Lake Erie smelt a year. But the lake could produce a much larger quantity if there was sufficient demand. Some estimates are as high as 50 million pounds a year.

In Lake Ontario there are thousands of tons of alewives, but they are not being fished because of lack of



A Manitoba commercial fisherman sets his gill nets under the ice on Lake Winnipeg with a "jigger." After the first hole in the ice has been cut, it is possible to set 50 fathoms of net in three minutes with this simple device.

markets. In Lake Huron there is a large chub (a variety of fresh-water herring) population, but the fishery has been limited due to market problems. The Fisheries Branch of the Manitoba Department of Mines and Natural Resources is desirous of finding markets for such species as suckers (mullet) and burbot (maria). Carp, sheepshead, buffalofish, and yellow perch could be exploited to a much greater degree than they now are.

The whitefish is one of the most popular of the fresh-water fish. But the meat of whitefish from some Canadian lakes contains foreign bodies (such as cysts) which though harmless to the consumer, interfere with marketing of the fish. At the present time the only practical method of handling such whitefish is to skin, fillet, and candle them. The foreign bodies show up as dark shadows and are cut out. A proportion of the cut-out fillets are used to make "gefite fish," but there is room for developing additional markets.

Research on Underutilized Species: Unwanted fish species have one thing in common--they are not popular with consumers. The underlying cause of their unpopularity varies with the different species. The fact that these fish are unpopular does not mean that they lack potential for the consumer market. Food technologists feel that a more complete knowledge of their composi-

tion and a better understanding of how to handle, process, and market them could mean the difference between an unsalable food product and a readily salable one.

The London Technological Unit of the Fisheries Research Board of Canada, in the five short years of its existence, has been actively investigating the underutilized fish problem in the Great Lakes and has made some useful discoveries.

Studies of the nutrient composition of each of the problem species have been made and are still in progress. As some of the species have been found to deteriorate rapidly, studies of the microflora (especially the spoilage organisms) found on them have been initiated. Studies of fishing gear, fish-processing equipment, and means of handling fresh-water fish products are a continuing part of the Unit's program. A senior scientist at the Unit is developing a variety of new products from the underutilized fish species which may have commercial application.

New Products from Underutilized Species: One of the scientist's current projects is the development of sausage-type fish products. Fish sausages, he affirms, are 100 percent edible, high in food value, and require little attention from the cook. If produced on a commercial scale to compete favorably in price with meat sausages, they would likely find a ready market. Three types of sausage are being investigated: (1) uncooked fish sausages, (2) cooked fish sausages (bologna-type rolls), and (3) cooked smoked fish sausages ("wieners"). All three have been prepared experimentally with success and seem to have a good market potential. More work has been done on the fish "wiener" than on the other two types of sausage.

Fish "wieners" have been prepared from burbot, carp, catfish, perch, sheepshead, smelt, sucker, and whitefish. All varieties with the exception of smelt have proved satisfactory. Carp and whitefish, because of the cohesive properties of the meat made the best "wieners." Blends of various species, especially those containing carp and whitefish, were excellent. Smelt was unsatisfactory because the meat lacked cohesiveness and developed a dirty grey color when minced.

The basic procedure for making fish "wieners" is as follows: Chunks of frozen fillets are minced to a pulp in a grinder and blended according to a precise formula with fat, spices, water, and a cereal binder. The homogenized product is then stuffed into animal or cellulose casings and tied off in links. Chains of these links are smoked according to a predetermined schedule, following which they are cooked in water and chilled.

The finished "wieners" look like meat wieners. They can be formulated to taste like meat "wieners" or to retain a distinctive fish flavor, whichever is desired. Work on them is continuing as there are still a number of variables to be determined before approved formulae can be offered to commercial producers.

Rivaling the "wieners" in popularity are the fish Bologna-type rolls. These are prepared from skinned fillets pressed together in a transparent casting with a binder substance like egg albumin, and then cooked. As is the case with the "wieners," it is important that the fish species selected to make the rolls have meat with good cohesive properties. Three such species found to make excellent fish rolls are whitefish, carp, and pike.

Canada (Contd.):

An interesting sidelight of the work on the fish sausages has to do with the mincing operation. Up to now, dressed fish could not be used to make sausages because of the bone. If in processing the bone could be finely ground and homogenized with the meat, the nutritional value of such products would be increased and the filleting operation eliminated. Recently a new cutting mill has been put on the market which reduces fish meat and bone to a smooth paste at a low temperature, using centrifugal force. The first one of its kind in Canada was expected to be delivered to the London Technological Unit.

Cut-out whitefish fillets have been tested in several new products, one being fish ball "servies"--all that has to be done is to heat and serve them. "Servies," like the sausages, are prepared from homogenized fillets. They are about the size of golf balls, golden brown on the surface and smooth, firm, and white on the inside. Their flavor is mild.

If produced commercially, the "servies" might be frozen and marketed in boilable plastic bags, each bag of a size to contain an individual serving. Ease of preparation would seem to make this product ideal for use in institutions where quick service is essential.

Another possible new use for the cut-out whitefish fillets is in patties. Fish patties have been prepared by molding uncooked minced fish in a patty-molding machine developed for the commercial manufacture of meat patties. Before serving, the patties were cooked by various means such as deep-frying, sauteing, baking, and boiling in a plastic bag. Three varieties of fish, whitefish, perch, and smelt, have been used to make the patties. Whitefish made excellent patties with smooth texture and good flavor. Perch patties were also good. Smelt did not make a product of acceptable quality.

A number of the new products developed have been freeze-dried in the medical laboratories of the Defense Research Board of Canada. Of these, the minced fish patties have been one of the most successful. Freeze-dried minced fish patties may be a food item that will develop successfully in the future.

A new method of dressing chub prior to smoking has been developed by the London (Ontario) Technological Unit. Chubs are found in substantial quantities in Lake Huron. The heads, tails, fins, and viscera are removed and they are spread open and flattened in such a manner that when viewed from the skinless side each fish looks like a fillet. After being dressed, they are soaked in brine and then smoked at temperatures progressing from 120-170° F. They emerge from the smoke tunnel fully cooked.

Canned Products from Underutilized Species: When the London Technological Unit was established in 1957, one of the first problems brought to its attention was the lack of market outlets for smelt, especially during the glut season. Canning, it was felt, might be an answer and so smelt canning experiments were initiated. The smelt were canned following basic fish canning procedures developed earlier at the Fisheries Research Board's Vancouver Technological Station.

As the work progressed, innovations were made. The smelt were canned in just about every conceivable manner which seemed practical. They were given various precanning treatments such as brining, smoking, marinating in vinegar, and breading followed by pan frying.

They were packed in various forms such as whole and ungutted, whole dressed, as fillets, and as rolled fillets ("rollmops"). They were packed with and without the skin removed. They were processed with added salt and with such other additives as oil, spices, and sauces. Some of the treatments produced better results than others. In general, however, the results indicated that a satisfactory canned smelt product can be obtained.

Canning experiments at the Unit were not confined to smelt alone. As additional equipment was installed, the experiments were broadened to include a wide variety of species from both the Great Lakes and the lakes of the Prairie Provinces. The following general observations resulted. Canning appeared to develop the flavor of certain species but not others. In some, it produced an undesirable aftertaste which may or may not be caused by overcooking or undercooking. The texture of canned fresh-water fish generally tends not to be as firm as that of canned salmon. It was found that fish of the same species taken from different lakes will, on canning, exhibit different flavor and texture characteristics.

When asked which of the Unit's canned products had the greatest potential for the Canadian market, one opinion was that whitefish canned in the salmon-type pack was an attractive product and could be rated first for flavor, with canned suckers a close second. Regarding the export market, it was believed that canned alewives, which could be produced at very low cost, might find favor in newly-developing countries. (Canada Trade News, May 1962.)

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NEW TAX APPLIES TO SHRIMP IMPORTED FROM THE UNITED STATES:

A new Canadian tax on imports has, in effect, offset the reduction in the duty rate on fresh, frozen, and canned shrimp granted to the United States in recent negotiations under the General Agreement on Tariffs and Trade (GATT). On July 1, 1962, the Canadian duty on shrimp imported from the United States and elsewhere was reduced from 10 percent to 5 percent ad valorem. Effective June 25, 1962, however, a 5-percent surcharge was added to many Canadian import duties including the duties on shrimp and other fishery products.

The surcharge or tax was one of the steps taken by the Canadian Government to stabilize its currency and to overcome balance-of-payment difficulties. Under the GATT, however, these surcharges must be removed as soon as these conditions have been corrected.

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PURSE SEINERS IN NEW BRUNSWICK CAN'T FISH WITHIN ONE MILE OF STATIONARY FISHING GEAR:

A new amendment scheduled to become part of Canada's New Brunswick fishing regu-

Canada (Contd.):

lations will prohibit purse seiners from operating within one nautical mile of fishing weirs and trap nets during the summer fishing season, according to a June 5, 1962, announcement by Canada's Department of Fisheries.

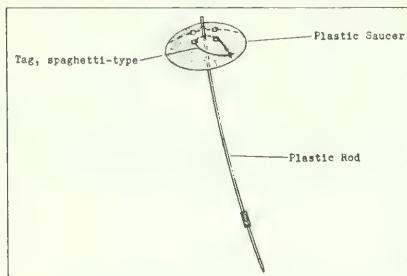
Canada's Fisheries Minister stated that steps were being taken to amend the regulations in force, which allow purse seiners to fish within one-half nautical mile of stationary fishing gear after discussions with the operators of weirs and trap-nets, as well as with the operators of purse seiners, particularly those in the Bay of Fundy area of Charlotte County, New Brunswick.

When in force, the one-mile restriction will be for the period April 15 to November 15 inclusive, which is the time when almost all the weirs and trap-nets are in operation. For the remainder of the year, purse seiners will be permitted to operate within 2,000 feet of any weir, trap-net, or any other stationary fishing gear being used.

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SEA-BED DRIFTERS USED TO STUDY NORTH ATLANTIC OCEAN CURRENTS:

A simple device called a sea-bed drifter is being used to get information about ocean currents. It consists of a weighted plastic rod with an orange plastic saucer at the top. Each drifter has a spaghetti-like tag tied to it. Scientists of the Fisheries Research Board of Canada are studying ocean currents that flow over the rich fishing banks along the Atlantic coast of Canada by using these devices.



Large numbers of sea-bed drifters were released over the Canadian Atlantic fishing

banks. They will be carried on the sea bed by currents and may be caught by fishermen in their otter-trawl nets or they may be washed ashore.

Fishermen or others recovering sea-bed drifters are asked to send the tag to the Fisheries Research Board at St. Andrews, New Brunswick. The Board wants to know the date and position of drifter when found as well as the kind of fishing gear, if applicable, with which it was picked up. The Board will pay a reward of one dollar for each sea-bed drifter tag returned with the required information. A description of where and when the sea-bed drifter was released will also be given those sending in tags. (Canada's Trade News, June 1962.)

Note: See Commercial Fisheries Review, March 1962 p. 21.

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SEA LION CONTROL PROGRAM IN COASTAL WATERS OF BRITISH COLUMBIA:

Professional hunters were hired by Canada's Department of Fisheries in 1962 in an attempt to reduce the number of sea lions in important fishing areas along the British Columbia coast. Sea lions have always plagued the gill-net and troll fisheries in certain of the better fishing areas. Some fishermen have had severe losses of catch, gear, and fishing time because of the animals. The total populations of sea lions in waters adjacent to British Columbia is estimated at 7,000-8,000 animals. Professional hunters have not been used before. In the past, Departmental officers stationed in areas where sea lions are known to be numerous have tried to control the sea lion population.

The new sea lion control program was described as "strictly experimental." But it has the full support of research scientists of the Fisheries Research Board of Canada who conduct extensive and continuing studies of sea lions in Canadian waters. Hunting is done under the close supervision of a scientific personnel or Fisheries Officers. A Vancouver company was given a contract for a four-week hunt. One week of the hunt was completed by June. Later in the season, the hunters were to return to the coastal areas for the remainder of the contract period.

The contracting company was also granted a permit to take 1,000 sea lions from rookeries at Cape St. James and in the Scott Islands. The sea lion control program in coastal waters is entirely separate from the com-

Canada (Contd.):

mercial hunt in the rookeries. This is the fourth year the company has engaged in the commercial sea lion hunt at the major rookeries. Investigations have shown that the reduction of sea lion stocks at the rookeries had no significant effect upon populations in areas near the fishing grounds. (Canada's Trade News, June 1962.)

**Cook Islands****JOINT JAPANESE-
NEW ZEALAND TUNA BASE:**

The Japanese are to take part in a tuna industry base at Rarotonga, Cook Islands. A canning factory is to be built at Rarotonga by a firm in the Cook Islands which is a subsidiary of a Dunedin, New Zealand, firm. The Japanese will provide boats and crews to catch the fish for the cannery.

Final details of the joint Japanese-New Zealand venture were being worked out in May 1962. Part of the deal is that the Japanese must help to train Cook Islanders in their boats. Each boat will train four Cook Islanders each year and use them at the end of their training to replace Japanese crew members. Eventually full crews will be Maori, under the scheme. However, the boats and the profits from the sale of the catch would still belong to the Japanese.

Meanwhile, the Cooks' Director of Fisheries is still going ahead with his plan to train Cook Islanders for tuna fishing. He is using Japanese fishing equipment. (Pacific Islands Monthly, June 1962.)

**Denmark****FILLETING ASSOCIATION SEEKS
CLOSER CONTACT WITH FISHERMEN:**

At the annual meeting of the Danish Flatfish Fillet Association in Esbjerg in late June 1962, it was noted that no decision was expected on the request that the filleting of frozen fish be approved until the Fisheries Ministry's Research Laboratory completed its study later in the year. There are divided views of the proposal in the Association. Filleting machines for flatfish are in use in

several filleting plants, but it is not yet possible to exercise final judgment on their value. The increase in the minimum size of plaice is a development in the right direction--larger fillets--but it is minor and has not been in effect long enough to determine any effect on prices.

Association members were not opposed to minimum prices sought by fishermen but indicated low prices were due to lack of organization with respect to landings. Fishermen seek the fish they can catch, leaving the distribution problem wholly to the buyers. This adversely affects prices and makes it difficult to take advantage of special supply and demand situations. Better contact between the filleters and the fishermen was urged for their mutual benefit. (Fisheries Attache, United States Embassy, Copenhagen, July 4, 1962.)

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FISHERIES TRENDS, JAN.-JUNE 1962:

Denmark's fishing industry may set new annual records for the amount of fish landed and the value of fish exported. Landings in January-June 1962 were 8 percent ahead of the same period of 1959 when the record annual catch was made. The value of exports of fishery products during the first half of 1962 was 16 percent greater than in the same period of the record year 1961. The value of exports of canned herring during the first half of 1962 was four times greater than in the same period of 1961; exports of lobster tails doubled in value; and exports of cod fillets increased 12 percent in value. But the value of exports of pond trout was down 33 percent. Denmark's total fishery products exports to the United States in the first half of 1962 were worth 26 percent more than in the same period of 1961.

Denmark's increased exports were achieved without subsidies. The fishing industry in Denmark contributes only one-half to one percent of the gross national product but accounts for about 5 percent of all exports. A need for Government or joint Government-industry support of ex-vessel fish prices has been expressed by fishermen. (United States Embassy, Copenhagen, August 1, 1962.)

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**INDUSTRIAL FISH LANDINGS
WERE HEAVY IN JUNE 1962:**

Fish reduction plants in the Esbjerg area of Jutland on Denmark's North Sea coast were overwhelmed with landings of in-

Denmark (Contd.):

dustrial fish, especially sand eels (*Ammodytes lanceolatus*) in June 1962. Sand eels are characterized as "soft" fish and lower appreciably the capacity of the reduction plants when not mixed with "firm" industrial fish, such as horse mackerel, whiting, etc. Between 4,000 and 5,000 metric tons of sand eels were reported landed in one day. Ultimately, this resulted in the dumping of 500 tons or more of sand eels at sea for which the cooperative reduction plant paid the fishermen the contract ex-vessel price of \$26.10 a metric ton. Cutters were placed on tonnage limits, deckloads were banned, and they were required to land in rotation. Prices for "firm" fish were temporarily increased from \$26.10 to \$29.00 a ton to induce fishermen to land those varieties.

During the period of restricted landings arrangements were made for cutters to land their catches in Norway and West Germany with IJmuiden in the Netherlands also expressing interest. Industrial fish landed in Cuxhaven, West Germany, by Danish cutters brought \$21.03 a ton and in Egersund, Norway, \$21.39 a ton. Under the circumstances, these net prices were considered reasonably satisfactory, although somewhat lower than the gross price of \$26.10 a ton prevailing in Esbjerg from which, however, landing costs must be deducted. By July 1 the landing limitations in the Esbjerg area had been raised considerably and it appeared that plant capacities again were in line with landings.

The immediate future of the Danish fishery for industrial fish was brightened by two decisions made at the Hamburg meeting dealing with North Sea Convention matters in May. The dispensation permitting Danish fishing vessels to land up to 10 percent undersize whiting in their industrial fish catches was continued until June 1, 1966. And a regulation in the Skagerak-Kattegat area, permitting small Danish craft to use a mesh smaller than prescribed by the Convention and to land unlimited amounts of undersize whiting, used mostly for brook trout and mink food, was extended until June 1, 1964. (Fisheries Attaché, United States Embassy, Copenhagen, July 4, 1962.)

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POND CULTURE OF RAINBOW TROUT:

Raising rainbow trout in ponds in Denmark is primarily a fresh-water culture, but some experiments have been conducted in rearing trout in salt-water ponds. In its 1960 annual report, the Technological Research Laboratory of the Danish Ministry of Fisheries stated that samples of rainbow trout transferred from fresh-water ponds for further rearing at a salt-water trout farm developed meat that was distinctly red. At the time of transfer, the fish ranged in weight from 3.5 ounces to 5.3 ounces. Their meat remained light-colored after a period of from 1 to 2-1/2 months in the salt-water pond, but after about 4 months the meat was a definite red color. There is very little salt-water culture of rainbow trout in Denmark, and experiments made so far were not successful in the opinion of some observers.

Salt-Water Culture of Rainbow Trout: To some degree, the unsuccessful experiments in salt-water rearing of rainbow trout may have been due to technical difficulties, such as barriers being broken down by storms, or fish being killed because of oxygen deficiencies in hot weather because of lack of currents in the water. Also physiological difficulties may have occurred, especially in winter, when the fish are unable to maintain the osmoregulation necessary to compensate for the salinity of the water. Nothing is done to control the salinity in the ponds. As a general rule salinity must not exceed 15 percent in the summer, and 10 percent in the winter.

In Denmark, rainbow trout reared in salt water are fed on fish just as they are in fresh-water ponds.

There has been little experience with diseases of rainbow trout raised in salt-water, but a bacterial disease resembling furunculosis has been observed, which was cured with sulfamerazine.



Fig. 1 - Fresh-water rainbow trout pond at Brøns, Denmark, about 45 miles south of Esbjerg. Originally started by trout pond operators as a research station, it was later offered to the Danish Government for research. Now it is jointly operated by the Government and the trout growers. Research is conducted to obtain better growth by experiments in genetics-mating best growers. Dry food from the United States is fed to the young trout, but older trout get fresh fish from Esbjerg.

Fresh-Water Rainbow Trout Culture: The common food used in fresh-water trout culture in Denmark is salt-water fish not used for human consumption--mostly small herring and whiting, and several other species. Dry food in pellet form is used to some extent when fry are fed in troughs.



Fig. 2 - Weighing Danish rainbow trout raised in fresh-water ponds. In 1961 about 7,000 metric tons of trout were produced in Danish ponds.

Denmark (Contd.):

As a rule, a quantity of about 100,000 pounds of trout is produced by a team of three men. (That production data assumes that fingerlings are not produced.) Normally a trout farm of that size has no production of fry and fingerlings. Usually the fingerlings are brought from smaller trout farms. Those smaller farms only feed the fish from the fry to the fingerling stage and they are then sold in the autumn or spring to the regular trout-producing farms.

The trout are marketed by the farms in three ways: packed in ice, frozen, and alive. Normal sizes of the fish are from 5.6 to 7.8 ounces, and from 7.8 to 9.2 ounces, but smaller amounts of larger fish also are sold. Live fish are transported by tank truck and rail tank cars to such countries as Switzerland, Belgium, Germany, France, Norway, Austria, Italy, and the Netherlands.

In Denmark, there are hatcheries which produce eggs and fry almost exclusively. Farms which produce commercial fish and eggs for export are also found. There are also farms which produce eggs, fry, fingerlings, and commercial trout.

The Danish Government does not operate any of the trout hatcheries that are operating. Fish for stocking domestic ponds are produced by privately-owned hatcheries. No government subsidies of any kind are given for the production or export of rainbow trout. (Regional Fisheries Attaché, United States Embassy, Copenhagen, July 18, 1962.)

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SEAWORTHINESS OF STEEL CUTTERS UNDER STUDY:

A study of the seaworthiness of Danish steel fishing cutters will require the construction of models and take one year, according to a professor of Denmark's Technical University, Copenhagen, who is now preparing a plan for the investigation. Fisheries Minister Normann requested the study of the stability of the steel cutters after three sank in the North Sea in a storm in February 1962. Many have contended that the traditional wooden cutters are preferable because they withstand heavy weather better.

At the end of 1961, the motorized Danish fishing fleet numbered over 8,000 vessels of which 96 were steel cutters, mostly measuring 95 to 120 gross tons. (Fisheries Attaché, United States Embassy, Copenhagen, July 4, 1962.)

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SECOND DANISH-BUILT FISH-FREEZING VESSEL FOR U.S.S.R.:

After only 19 days in the working dock, a Copenhagen shipyard launched the M/S Vitus Bering on June 9 for V/O Sudoimport, Moscow. The vessel is the 21st refrigerated type constructed by the shipyard for the U.S.S.R. since World War II and is the second in a series of four fish carriers.

The vessel has a dead weight of about 2,600 tons, is 91 meters (298.5 feet) in length between perpendiculars, and has a beam of 16 meters (52.5 feet). It is driven by a 6-cylinder Diesel engine developing 3,530 horsepower. Speed during loaded trials was 14.0 knots. Auxiliary machinery consists of three 6-cylinder and one 3-cylinder Diesel engines. In the boiler room is an oil-fired boiler with a steam production of about 3,000 kilograms per hour. The propelling machinery and refrigerating machinery are located amidships, with large refrigerated-cargo holds fore and aft. The quarters for the vessel's crew and factory staff (about 102 men) are extremely comfortable, considering the general standard of accommodation in fishing fleets. Specifications are the same as for the Skryplev, the first in the series, christened May 10, 1962.



Fig. 1 - The M/S Vitus Bering, fish-freezing vessel built in Denmark for the U. S. S. R. Shows vessel almost completed on 19th working day.

The Vitus Bering is equipped with controllable-pitch propeller which can be operated either from the main bridge or from a small bridge placed immediately above the stern ramp. In view of the very stringent requirements with regard to accurate and careful maneuvering while the catch is being taken aboard, the vessel is also equipped with a so-called "activated rudder," consisting of an electrically-driven propeller mounted in a nozzle on the actual rudder. This special rudder arrangement makes it possible to turn the vessel even when she is making no headway.

Denmark (Contd.):

Construction time in the dock was cut from 74 to 19 days by assembling the vessel in six sections. The sections were carried to the building dock by means of two large gantry cranes which have a capacity of 600 tons in one lift. The main engine, weighing 90 tons, was also lifted into the ship in one piece. In addition to reducing the time of construction, the prefabricated method of ship building reduced the amount of out-of-door work required. The work was thus less hampered by bad weather.

The Vitus Bering is intended to serve as mothership and refrigerated fish carrier for the Soviet trawler fleet operating in various waters--the North Atlantic, the Arctic Ocean and the Pacific Ocean. She represents the most up-to-date trends in her field.

The catch will consist mainly of cod. The vessel is provided with a large ramp at the stern so that the fish can be taken aboard direct from the sea, and there is a gate with which to close the opening. The fish are taken over from the fishing fleet in two days. Either direct from the vessels over the ship's side as hitherto or, as something entirely new, from trawl bags which are left by the trawlers in the water and marked by a buoy. Often these buoys are provided with radar reflectors so that the Vitus Bering will be able to locate them easily by means of radar.

total of 10 metric tons of scale ice per day. Irregular fish is sorted out on the deck and poured into the raw product bunker of the fish-meal plant.

From the raw product bunker all transport of the fish is mechanical right up to its being stored in cartons in the holds. On the way the fish is slit open and gutted. This process is still done manually but with automatic feed and removal at the working places. There are special machines for cutting off the fish heads. After washing in continuously-working washing machines, the fish is weighed out automatically in portions of about 10 kilograms (22 pounds), tipped into trays with spring-loaded lids and taken to the freezing tunnel.

After approximately half an hour's freezing, the lids are removed and the block of fish, which will now retain its shape, is given about four hours' final freezing. Then the fish is loosened from the trays by superficial thawing, it is glazed by immersion in water for a few seconds, and is taken via a reception conveyor on to the packing site. The entire further preparation of the iced fish requires only 4 men, whereas in previous refrigerator vessels delivered to the Soviet Union, this work required 8 men.

The entrails and fish heads are taken automatically from the cutting tables to the raw product bunker of the fish meal and fish oil plant, which has a capacity to process 30 tons

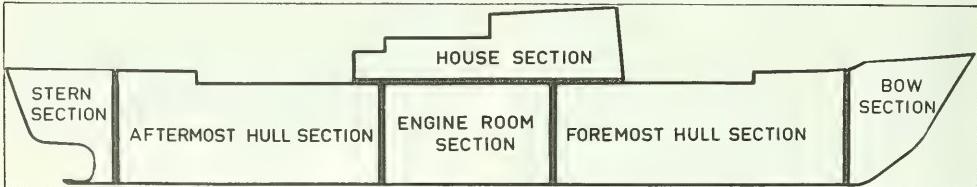


Fig. 2 - The M/S Vitus Bering was constructed from six sections. On the 1st working day (May 12, 1962), the keel was laid down and engine-room section erected (weight 425 tons). On 3rd working day (May 15), aftermost hull section erected (weight 357 tons). On 4th working day (May 16), the stern section erected (weight 86 tons). On 11th working day (May 26), foremost hull section erected (weight 414 tons). On 13th working day (May 29), bow section erected (weight 76 tons). On 19th working day (June 7), house section erected (weight 149 tons).

By means of a line-throwing apparatus, a catching device is shot over a floating line attached to the bag. A powerful winch then hauls the catch up the stern ramp and on to the deck where it is emptied into stalls. From here the fish is skidded directly to the ship's two raw product bunkers. For short-time preservation of the fish, two ice generators are installed in connection with the fish stalls which, from seawater, can produce a

of raw products per day. In the treatment of cod, the liver is separated from the entrails and is processed into medicinal oil in a special liver-oil plant. Two fresh-water generators with a capacity of 20 tons per day take care of the fresh-water supply. (Fisheries Attaché, United States Embassy, Copenhagen, June 19, 1962.)



Ecuador

COASTAL FISHING PROBLEMS BEING STUDIED:

A delegation from the Province of Manabi met with Ecuador's Minister of Development early in July concerning economic problems of the Province, including coastal fishing problems. The following account of statements made by the Minister with respect to fishing is taken from the Quito daily El Comercio of June 29, 1962.

The Minister referred to fishing as one of the activities with greatest possibilities in the Province of Manabi and stated that the Ministry of Development was preparing a program for the promotion of fishing which was national in scope but with greatest emphasis in the Province of Manabi. The program includes technological help to the individual fisherman. The Minister commented that Ecuador has a large domestic market for fish consumption which has not been sufficiently developed because of transport difficulties and an inadequate distribution system. The Ministry of Development, he added, is planning with the Ministry of Economy the installation of freezing plants to help this situation. The program also would assist the fishermen grouped together in associations to improve their equipment so that they would be more nearly able to compete with foreign fishermen fishing in Ecuadorian waters. He referred to the necessity of converting the Ecuadorian fishing fleet to the purse-seiner system.

The Minister also stated that final details were being completed for the establishment of a mixed Japanese-Ecuadorian company which would establish freezing plants for the export and canning of tuna and other fish. Representatives of the Japanese company, according to the Minister, were scheduled to arrive in Ecuador on July 6, 1962. (United States Embassy report, Quito, July 11, 1962.)

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MANTA TUNA FISHERY:

Purse seiners were prohibited from fishing within 40 marine miles of the Ecuadorian coast between Cabo Pasado and Punta de Santa Elena by the Government of Ecuador on May 31, 1962. One of the objectives of the ban on purse-seine fishing was to protect the local bait-boat tuna fishery at Manta.

The Manta fishing fleet consists of two types of vessels, a canoe fleet that fishes nearby waters, mainly for the local fresh market, and a fleet of tuna boats. While the catch of the canoe fleet includes some skipjack tuna, their production is of no consequence to the cannery at Manta. The tuna fleet at Manta consists of 32 bait boats, ranging in carrying capacity from 5 to 55 tons. Propulsion is by Diesel engines averaging about 135 horsepower, but ranging up to at least 180 horsepower. Their speed is about 8-10 knots. Crew size varies from 15 to 25, which (if an estimated average of 20 is used) suggests that the total number of bait-boat fishermen in Manta is about 640.

The Manta bait-boat fleet is locally built and new. According to representatives of the tuna cannery at Manta, their company began to provide interest-free loans for tuna vessel construction in 1958. Since then the local bait-boat fleet has been built on the beach nearby. At present, the fleet fishing capacity is sufficient to supply the cannery for a substantial part of the year, and the construction of additional vessels is not being encouraged. The local fishing skippers, who received loans from the cannery, have become land-based managing owners, according to the company. A part of the daily catch is used to retire the loan on each vessel. The amount subtracted for this purpose varies with the catch (from zero for catches less than 5 tons to 25 percent for catches over 25 tons). In the Manta fleet the crew share is about 40 percent and the vessel share 60 percent.

The superstructure of the Manta bait boat is centered forward of midships and the pilot-house is well forward. Bait tanks are located in the space aft of the cabin. Racks are used during fishing. The vessels are not refrigerated, the catch being protected from the heat with damp cloths.

Fishing trips are usually completed in a day. The fishing operation begins shortly after midnight. The vessels take a position along the beach in the harbor and hang out lights to attract the local bait species. Around 4:00 or 5:00 a.m. a net is used to catch the bait fish needed for the day. About 5:30 a.m. the fleet departs for the fishing grounds, the closest of which are about an hour's run.

The seasonal availability of tuna in Manta waters is not fully understood. Skipjack tuna

Ecuador (Contd.):

are by far the most abundant species. They are usually taken during the period extending from April or May to August or September. But in 1961, skipjack catches fell off in August and September and then improved with good fishing lasting until December. In 1962, good catches of skipjack were not made until May, whereas in 1961, good fishing began in April.

It is common for the cannery to can frozen fish at the start of the day before any landings have been made.

Skipjack tuna is packed in several styles and can sizes at Manta. The company produces a four-pound solid pack, a one-pound tall chunk style pack, a one-half pound solid pack, and a one-half pound grated pack. Brine or oil is added to the pack, depending on the style of the pack and the intended market. A



A general view of the Port of Manta.

The canning plant in Manta has a cold-storage capacity of about 2,000 tons. Two California-type bait boats of Panamanian registry have recently been brought to Manta, and these provide an additional 250 tons of frozen storage capacity. Under ideal conditions, the daily freezing capacity of the plant, as of May 1962, was about 150 tons. The canning capacity is 50 tons per day. Additional construction is under way to make sure that the cited maximum tonnages of freezing and canning capacity can be attained under average conditions.

When fishing is very good, the existing fleet can bring in more fish than can be canned or refrigerated. Thus, during May, June, and July, it is common for the boats to be on limits.

The catch is unloaded offshore. The fish are first transferred to large dugout canoes which carry the catch about 100 yards to the beach. Then the fish are loaded on trucks and hauled to the plant. At the cannery the fish are processed almost immediately or are frozen for processing at another time.

significant amount of tuna is sold in Ecuador. Local sales have tripled since 1960. The cannery employs about 320 people. All are Ecuadorians except the general manager, plant manager, and fleet manager.

While the cannery and fishing operations appear to be contributing significantly to the economy of Manta, problems exist. One problem involves relations between Ecuadorian and foreign fishermen. The friction between fishermen was partly due to the scarcity of fish during the off-season. Since, in 1962, skipjack were not available to the local bait-boat fishery until a month later than in 1961, the Ecuadorians believed that fishing by purse seiners was driving the fish down where they were inaccessible to the local bait boats. By late May 1962 the situation had changed. Only 2 or 3 large purse seiners were in nearby high-seas waters at that time and the catch by local bait boats was excellent.

The fact that skipjack are only seasonally available in local waters causes economic hardship among bait-boat fishermen. Skipjack is the only local species that can be

Ecuador (Contd.):

marketed in quantity at present by the bait boats. The ocean offshore from Manta is reportedly rich in marine life, and a variety of species is taken by the canoe and tuna fleets when there is a market for the catch. It may be possible to can and market species other than tuna. A "blue mackerel" seems to have the greatest potential. It appears likely that the market for low-priced canned fish would be mainly in Ecuador and nearby countries.

Fish are a popular food in Manta. It has been reported that crowds of people are on hand when boats land, and that afterwards, hundreds of fish are hand-carried to Manta homes.

Note: See Commercial Fisheries Review, Aug. 1962 pp. 25 and 61; June 1961 p. 57.

**El Salvador****FISHERIES TRENDS,
SECOND QUARTER 1962:**

Tuna Resources: Studies by the Inter-American Tropical Tuna Commission and the Food and Agriculture Organization (FAO) indicate a considerable amount of tuna near the Salvadoran coast. The Government of El Salvador was expected to license a vessel to fish yellowfin tuna on an experimental basis. The Ministry of Economy of El Salvador had received five license applications to fish for tuna as of July 1962. Several vessels originally purchased for shrimp fishing may be used for tuna fishing. The Government of El Salvador is encouraging local and foreign investments in freezing and canning facilities.



Spiny Lobster Fishery Promising: Significant catches of spiny lobster were reported during the second quarter of 1962. Lobstermen are seeking means to export their prod-

uct. (United States Embassy, San Salvador, July 24, 1962.)

Note: See Commercial Fisheries Review, February 1962 p. 64.

**Fiji Islands****JAPANESE FISHERIES AGENCY
POSTPONES DECISION ON FIJI
ISLANDS TUNA BASE:**

The Japanese Fisheries Agency is reported to have postponed approval of the application submitted by the South Pacific Ocean Fisheries Cooperative Association to establish a tuna base at Levuka, Fiji Islands, in cooperation with a British fishing and canning company. The Fisheries Agency is said to have taken this action since the Cooperative Association does not possess licensed tuna vessels; consequently, approval of the proposed venture would be meaningless. The Agency is reported to have instructed the Cooperative Association to submit a more detailed report of its business plan, but the Association is withholding its reply to this instruction because it feels that it cannot prepare a detailed plan until such time that the Agency formally clarifies its position regarding the licensing of additional tuna vessels totaling 20,000 gross tons.

The Association had submitted on April 25 of this year its application to establish a tuna base at Levuka. Under the automatic approval clause of the Fisheries Cooperative Association Law, an application is automatically approved if the Fisheries Agency does not act on it within two months of its submission date. Thus, the application submitted by the Cooperative would have been automatically approved on June 24. However, to temporarily halt the application of the clause, the Agency on June 17 applied another provision within the same law which requires applicants to state in clear detail their operational plans. (Suisan Keizai Shimbun, June 28, 1962.)

**France****UNITED STATES QUALITY
CERTIFICATION OF FRESH OR
FROZEN SCALLOPS ACCEPTED:**

In response to a Government request, the French market has recently been opened to

France (Contd.):

United States exports of fresh and frozen scallops.

The French Institut Scientifique et Technique des Peches Maritimes, decided in June 1962, to recognize the U.S. Department of the Interior's "Certification of Quality and Condition" for scallops as a certificate of wholesomeness. This was considered sufficient sanitary documentation for the importation into France of United States-produced fresh or frozen scallops for immediate consumption. The phrase, "immediate consumption" is interpreted to preclude any further processing in France from the fresh or frozen condition, such as canning, etc.

Under French regulations such certificates, signed by a recognized authority, must accompany shipments of scallops to France.

Imports of scallops into France are free from quantitative restrictions and import licensing. The import duty is low--9 percent ad valorem on c.i.f. (cost, insurance, and freight) value--and additional import taxes are negligible.

The prospects for the sale of scallops in France are good. Domestic production does not satisfy the demand, particularly for frozen scallops, and there is an active interest in importing them from the United States.

The Certificate of Quality and Condition which must accompany each shipment may be obtained from the Regional Director of the U.S. Bureau of Commercial Fisheries. Applications from the New England area, for example, should be sent to the Regional Office at Gloucester, Mass. (United States Embassy, Paris, June 20, 1962; International Commerce, August 13, 1962.)

Note: The names of French importers of fish and seafood are available in a Commercial Intelligence Division trade list titled Provisions--Importers and Dealers, France, which may be purchased for \$1.00 from U. S. Department of Commerce field offices. The relative size of each firm, products handled, and size of sales force are indicated in the listings.



Greece

FREEZER-TRAWLER LANDINGS,
JANUARY-JUNE 1962:

In the first half of 1962, freezer-trawler landings in Greece totaled 7,481 tons, an in-

crease of 15.3 percent over the 6,488 tons landed in the same period of the previous year. It had been predicted that landings by the freezer-trawler vessels would reach 8,500 tons in the first half of 1962. Landings did not match expectations because of a prolonged decline in the catch from the Mauretania fishing grounds.

Although freezer-trawler landings increased in Greece in 1962, the increase was not as large as was expected. In June 1962, 6 vessels landed 1,850 metric tons of frozen fish as compared with landings of 1,252 tons by 3 vessels in the previous month. In June 1961, 3 vessels landed 687 tons of frozen fish. (Aleiea, July 1962.)



Greenland

SHRIMP INDUSTRY:

Greenland is planning to increase shrimp output, particularly for export markets. In 1961, the shrimp production, supervised and marketed by the Royal Greenland Trading Company (with offices in Copenhagen), amounted to over three million cans, vacuum-packed bags, and jars. An additional 125 tons of frozen shrimp in bulk were exported also. Although much of the shrimp for canning is peeled by hand, shrimp-peeling machines are in use. Machine-peeled shrimp have a considerable sale in the United States, while France prefers a specialty pack of frozen unpeeled shrimp.

From May to November, as the ice barrier of the Arctic Sea withdraws under the Midnight Sun, small shrimp boats leave the towns around Disko Bay on the west coast of Greenland to fish the shrimp area that biologists have determined as the richest ever found.

Fishing is done at about 200 fathoms. The shrimp are red when removed from the water. The fishermen seldom stay out long in these dangerous waters; they return to port each day. The catch is landed and delivered to modern factories in the coastal towns for processing.

Much of the catch is still peeled by hand for canning. On the average, a Greenlander woman can peel about $4\frac{1}{2}$ pounds of cooked shrimp an hour, but in some plants, machines have replaced the hand peelers. The machines

Greenland (Contd.):

can peel about 650 pounds an hour. (The Fishing News, June 15, 1962.)

Note: See Commercial Fisheries Review, July 1962 p. 64.

**Iceland****FISHERIES TRENDS,
JANUARY-JULY 1962:**

Landings: All species of fish landed by Icelandic vessels in the first four months of 1962 totaled 193,399 tons as compared with 185,943 tons in the same period of the previous year. The increase in the herring catch was partly offset by a decline of 6,000 tons in groundfish landings. The decline in groundfish landings was due to a drop in landings by the trawler fleet.

Trawler Fishery: The trawlers had poor catches early in the year and then on March 10 they stopped fishing because of a dispute between the trawler seamen's union and vessel owners over wages and terms. The dispute was settled on July 18, but the trawlers were slow to resume fishing. By August 2, only 9 trawlers were fishing. An additional 4 or 5 trawlers were transporting herring.

Iceland's own trawlers were excluded from certain inshore fishing grounds when Iceland extended her fishing limits to 12 miles. Since then the trawlers have operated at a loss. The Government recently passed a bill that will provide about 60 million kroner (US\$1.4 million) to help compensate trawlers for their losses in 1960 and 1961. The money will come partially from the existing fisheries catch guarantee fund, which is financed by export levies placed on the motorboats as well as the trawlers, and the balance (about half) is matched by the Treasury.

Trawler Dispute Settled: Employers and seamen on July 18 approved the wages and terms agreement made by their representatives on July 5. Seamen will improve their earnings from the share-of-the-catch under the terms of the new agreement. The Chairman of the Seamen's Federation described the increase as "20-21 percent, provided that half of the catch is for the domestic market and the other half for the foreign market." Reports of good catches of cod and haddock off Greenland's east coast had exerted pressure for settlement of the dispute.

Even though the trawlers were free to go to sea on July 19, other problems were to delay their sailing. Only part of the fleet had been fitted out at that time. The press reported that trawler officers were negotiating with owners for better wages and terms. Also, the question of what additional government assistance the trawlers may receive had not yet been settled satisfactorily from the owner's viewpoint. The trawler strike was marked by a sharp controversy over the possibility of allowing Icelandic trawlers to conduct more extensive fishing within the 12-mile fishing limits off the Icelandic coast. At a July 5 meeting of the Reykjavik City Council, the Mayor (supported by Independent and Social Democratic Party members) spoke in favor of such trawler relief. The Progressive Party members pointed out that such steps would greatly endanger both the operations and catch of the smaller motor fishing vessels, and might prompt foreign countries to demand similar rights for their trawlers.

Herring Fishery: An excellent winter herring catch off the southwest coast of Iceland was followed by record landings from the summer herring fishery off the north coast. Winter herring landings in the first 4 months of 1962 amounted to 41,080 metric tons, a gain of 52.0 percent over landings of 27,027 tons during the same period in 1961. The summer herring season was delayed this year until June 24 by a dispute between fishermen and vessel owners over division of the proceeds of the catch. But by July 22, the summer herring catch amounted to 114,264 tons, a gain of 6.7 percent over the catch of 107,055 tons by the same date last year. The improvement in herring catches in the last two years was partly due to the use of more efficient equipment by part of the herring fleet. Some vessels added sonar to locate schools of fish, and power gear to haul loaded nets.

North Coast Herring Season: By mid-June 1962 fishing vessel owners and fishermen were still in disagreement over division of the herring catch. Because it was feared the start of the Icelandic north coast herring season might be further delayed, a Provisional Decree was issued by Iceland's President on June 24, making it possible for the fleet of about 240 herring vessels to put out to sea. The vessels moved promptly to the herring runs off the north coast and caught moderate quantities of what was considered good fat fish. Herring had moved close to shore and even into the fjords this summer. By July 1, a total of 14,518 metric tons was

Iceland (Contd.):

caught as compared with 21,307 tons by the same date the previous year when there was no delay in the start of the fishery. A total of 65,612 metric tons of herring had been landed by July 15, 1962, as compared with landings of 77,424 tons by the same date last year. The catch in 1961 was the largest since 1944. This year's catch consists of good quality herring, and salting proceeded normally.

The Provisional Decree was hailed by the Social Democratic and Independence Party press, but was denounced by the Central Board of IFL as "violation by State power of the basic rights of labor unions." *Timmin*, a newspaper, reflecting the views of the Progressive Party, charged that the Government was acting too late.

Since the Icelandic State Mediator believed that further negotiations between both parties involved in "share-of-catch" dispute was futile and since no agreement was reached before July 10, 1962, an Arbitration Board (with a majority of its members chosen by the Supreme Court) was appointed to decide the question.

Herring Dispute Settled: The Arbitration Board decided the herring dispute. Crews of boats equipped with Asdic finders and power haulage systems were awarded 34.5 to 35.5 percent of the value of the catch depending on the size of boat. The old contract, giving 40 percent of the catch value to crew members, will remain in force for boats without such equipment (about one-third of the fleet). The minimum monthly wage, payable in case of a poor catch was raised from 5,365 kroner (US\$125) to 6,610 kroner (US\$154). Each seaman gets a free 200,000 kroner (US\$4,657) life insurance policy, and 1 percent of the value of the catch goes into a medical aid fund for seamen.

Salted Herring: Herring salting began on July 4, with the fat content fixed at about 20 percent. In 1961, salting started on June 19. A total of 8,255 tons had been salted by July 15, 1962. Prices received for salted herring in June were higher than in 1961, and the United States figured substantially in sales for the first time in a number of years. Negotiations were continued with the Soviet Union, which bought 40,000 more barrels than the 120,000 barrels of salted herring called for in the trade protocol during 1961. The

Soviets wished to decrease correspondingly the amount purchased in 1962. As of July 27, the Soviet Union had not renewed its contract to buy salted herring from Iceland.

The Herring Production Board concluded some contracts for the prospective north shore herring catch as follows: for salted herring, 165,000 barrels to Sweden and Finland, and 11,000 barrels to the United States.

Herring Meal: Prices for herring meal at 16 to 18 shillings (\$2,248 to \$2,529) per unit of protein were fairly good, but herring oil prices were not considered good. By July 15, a total of 55,826 tons of herring had been sold to reduction plants. About 92,761 tons of the herring catch to July 22, 1962, was used for meal and oil as compared to 62,727 tons used for meal and oil by the same date last year. The export price for herring oil in July 1962 was £37.1 per metric ton (4.7 U.S. cents per pound). In July 1961, export prices for Iceland herring oil ranged as high as £70.0 per metric ton (8.9 U.S. cents per pound). The decline in herring oil prices was due to severe competition from Peruvian anchovy oil, United States menhaden oil, and vegetable oils. Contracts made by the Herring Production Board for herring meal and oil amounted to about 148 million kroner (\$3.4 million)--about 14,000 metric tons of meal and 11,000 tons of oil.

Production and Marketing: The value of frozen fillets exported during the first five months of 1962 was 55 percent greater than in the same period of 1961 and accounted for 30 percent of the value of Iceland's total exports. Early in 1962 the U.S.S.R. contracted to buy 13,000 metric tons of frozen cod and 5,000 tons of frozen perch during 1962, for £145 per ton (18.4 U.S. cents per pound). Iceland sold frozen fish to the Soviet Union in 1961 for £128 per ton (16.3 U.S. cents per pound). Although the fish could probably have been sold to the Western countries, the contracts were made at a time when the Freezing Plants Corporation was having difficulty in making prompt payments to its members from sales in the United States. Later the Freezing Plants Corporation and Samband, the other major frozen fish exporter, received working credits of US\$4 million from two New York City banks. The credits enabled them to make prompt payments for fish sold in the United States. The Freezing Plants Corporation has reorganized its sales organization in order to increase its sales of frozen fish to the Western countries. A new frozen fish

Iceland (Contd.):

exporter, Atlantor Ltd., entered the frozen fish export business with five freezing plants at the beginning of 1962. It has been successful in selling all its frozen fish to Great Britain and the United States and in making prompt payments to its member plants.

In order to take advantage of the vast fish market developing in Africa, the Ministry of Foreign Affairs is planning to send a commercial representative to Nigeria. This area has long provided Iceland with a market for stockfish. The spread of refrigeration equipment in the more developed countries of Africa has caused this area to be considered as a potential market for frozen fish exports. Iceland would welcome an additional market for its fish, especially if it does not reach a favorable arrangement with the European Common Market.

Whaling: Iceland was enjoying a record whaling catch this season. On June 27, the Icelandic State Radio announced that 137 whales had been caught compared with 87 by the same time in 1961. From May 20, the opening of the season, until July 26, a total of 269 whales were caught as compared to 165 for the same period in 1961. But the price of whale oil slipped to £45 per long ton (5.6 U.S. cents per pound) in July 1962, down 38.5 percent from the price in 1961 of £73.1 per ton (9.1 U.S. cents per pound).

Soviet Research Vessels: Two Soviet oceanographic research vessels arrived in Reykjavik on July 13, 1962. The newspaper Morgunblaðið said that the Foreign Office had allowed the vessels to enter to take on water and provisions. (United States Embassy, Reykjavik, July 13, 20, 27, and August 3, 1962.)

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EXPORTS OF FISHERY PRODUCTS,
JANUARY-MAY 1962.

JANUARY-MAY 1962.
During January-May 1962, there was a considerable increase in exports of frozen herring, frozen fish fillets, salted herring, herring oil, and herring meal as compared with the same period in 1961, according to the Statistical Bureau of Iceland's Statistical Bulletin, June 1962. Exports of fish meal and ocean perch meal showed a considerable decrease in the first five months of 1962.

Product	Jan.-May 1962			Jan.-May 1961		
	Qty. Metric Tons	Value Kr.	f.o.b. US\$ 1,000	Qty. Metric Tons	Value Kr.	US\$ 1,000
Salted fish, dried	1,215	24,053	558	2,321	44,205	1,158
Salted fish, uncured	14,043	172,356	3,999	11,364	13,954	2,981
Wings, salted	735	8,481	197	1,203	11,108	291
Sturgeon	4,041	10,600	2,159	5,000	11,700	3,000
Herring on ice	4,828	18,000	302	3,754	10,000	3,000
Other fish on ice	12,864	58,339	1,353	13,984	58,065	1,521
Herring, frozen	11,580	60,942	1,414	7,926	39,208	1,027
Other frozen fish, whole	857	11,027	256	672	6,995	183
Frozen fish fillets	26,611	455,084	10,581	17,127	255,981	6,811
Crab meat, lobster, frozen	1,000	1,439	35	1,000	1,439	32
Roes, frozen	592	1,149	261	472	1,000	261
Canned fish	87	5,797	134	110	7,127	177
Cod-liver oil	1,813	14,499	336	1,873	14,975	392
Lumpfish roes, salted	246	3,686	86	332	5,518	151
Other roes for food, salted	2,709	37,428	865	2,321	23,403	615
For fish, salted	337	2,954	48	337	2,954	48
Herring, salted	16,723	149,424	31,676	7,688	57,142	15,111
Herring oil	17,823	75,865	1,783	4,293	23,944	601
Ocean perch oil	55	59	19	1,109	19	1
Whale oil	388	2,558	59	-	-	-
Fish meal	12,641	78,305	1,817	20,765	79,058	2,071
Shrimps meal	18,651	116,322	2,689	9,881	37,262	958
Ocean perch meal	53	34	5	5,559	1,000	25
Wastes of fish, frozen	1,818	4,505	105	3,947	7,610	195
Liver meal	170	1,119	26	-	194	25
Lobster and shrimp meal	-	-	-	-	376	76
Whale meal	302	1,567	36	305	1,025	27
Whale meat, frozen	151	1,097	25	292	1,965	51

Chlorophyll

ICELANDIC PRODUCTION OF PROCESSED FISHERY PRODUCTS AND BYPRODUCTS. 1960-61:

Product	1961			1960		
	Qty. Metric Tons	Value Million Kroner 1,000	US\$ 1,000	Qty. Metric Tons	Value Million Kroner 1,000	US\$ 1,000
Frozen:						
Pilchard	48.5	802.9	19,751	58.8	862.6	25,220
Fish waste	5.6	18.2	440	10.8	19.2	506
Herring	18.6	97.7	2,404	8.8	52.4	1,373
Fish roe	0.7	10.2	251	0.7	9.4	247
Shrimp and lobster	0.6	54.2	1,333	0.4	40.5	1,068
Total Frozen	77.9	882.3	21,187	78.5	1,084.3	28,409
Cured:						
Salt fish, dried	2.5	51.3	1,262	5.5	109.8	2,879
Salt fish, wet	24.6	273.2	6,721	22.7	232.0	6,078
Stockfish	8.1	208.9	5,183	8.4	241.7	6,033
Fish, pickled, salted	40.4	100.0	1,298	26.7	22.7	51,901
Fish Roe	4.4	47.5	1,168	0.4	9.4	247
Other	1.8	15.6	384	0.4	2.7	71
Total Cured	90.8	1,097.4	26,996	84.1	815.1	21,356
Canned:						
Fish	0.4	12.8	315	0.5	18.4	482
Shrimp	1/	4.8	118	-	5.7	149
Total Canned	0.4	17.6	433	0.5	24.1	631
By-Products:						
Meat:						
Herring	43.6	244.1	6,005	19.5	85.3	2,235
Ocean perch	4.6	22.1	544	10.1	37.3	977
Lobster	0.2	0.5	12	0.2	0.1	71
Liver	0.3	2.2	54	0.4	0.7	166
Bone products	19.6	81.3	1,997	23.4	91.9	2,408
Oil:						
Ocean perch	1.2	6.2	153	2.3	13.5	354
Herring	38.1	180.1	4,465	59.2	200.1	5,011
Cod	5.8	50.5	1,242	10.5	71.0	1,860
Solubles (50% solids)	2.9	4.9	121	1.2	2.3	60
Total By-products	117.4	601.8	14,804	85.8	411.0	10,768
Fish landed abroad:						
on ice	36.9	204.6	5,033	29.1	127.1	3,330
Fresh-water fish	6.3	35.4	871	6.7	48.9	1,281
Home consumption	17.3	65.7	1,616	17.0	63.4	1,661
Trimmings	0.2	1.5	37	-	-	-
Total Misc.	63.7	307.2	7,557	52.8	239.4	6,272
Grand Total	2,350.2	3,007.2	73,977	28.7	2,573.9	6,436

¹Inclusive of 50 tones of shrimp in 1961 and 60 tones in 1960.

²Includes 50 tones of salmon in 1961 and 1960, 100 tones of herring, 200 tones of cod, 21,264 tones of mackerel, 600 tones of anchovy, and other 873 tones.

³Values converted at rate of 1 kroner equals 2.6 U.S. \$, same in 1961, and 2.6 U.S. \$, same in 1960.

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Iceland (Contd.):

FISHERY LANDINGS BY PRINCIPAL SPECIES, JANUARY-APRIL 1962:

Species	January-April	
	1962 . (Metric Tons) 1/.	1961
Cod	115,009	120,943
Haddock	13,436	14,057
Saithe	5,020	3,276
Ling	3,755	2,743
Wolfish (catfish)	7,142	7,328
Cusk	3,285	3,129
Ocean perch	2,585	5,265
Halibut	450	478
Herring	41,080	27,028
Shrimp	309	430
Other	1,328	1,266
Total	193,399	185,943

1/Except for herring which are landed round, all fish are drawn weight.

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UTILIZATION OF FISHERY LANDINGS JANUARY-APRIL 1962:

How Utilized	January-April	
	1962 . (Metric Tons) .	1961
Herring 1/ for:		
Oil and meal	22,862	11,089
Freezing	9,592	6,758
Salting	3,182	6,038
Fresh on ice	5,375	3,143
Canning	69	
Groundfish 2/ for:		
Fresh on ice landed abroad	12,278	10,617
Freezing and filleting	65,386	66,203
Salting	47,122	45,480
Stockfish (dried unsalted)	22,969	32,385
Home consumption	3,427	2,690
Oil and meal	828	1,110
Shrimp for:		
Freezing	230	304
Canning	79	126
Total production	193,399	185,943

1/Whole fish.

2/Drawn fish.



Indonesia

SOVIET TECHNICIANS PLAN CONSTRUCTION OF OCEANOGRAPHIC SCHOOL:

Soviet technicians this summer arrived in Ambon, Indonesia, to begin planning for construction of an oceanographic school. Housing for Russian and Indonesian workers is being built. Construction materials and equipment to build the school was expected to arrive in September. (United States Consulate Surabaya, July 5, 1962.)



Iran

STATUS OF FISHING INDUSTRY:

Iran's fishing industry is one of that country's minor industries, employing some 12,000 persons. It is to a great extent carried on by independent fishermen and fishing enterprises who use primitive fishing equipment and techniques. Iran's annual fish and shellfish catch is estimated at from 20,000 to 25,000 metric tons. The most important fish species caught in the Caspian Sea are sturgeon, white salmon, white fish, carp, bream, pike, catfish, and herring. Species caught in the Persian Gulf include sardines, tuna, bream, snappers, mackerel, and shrimp.

Iran is a major source of the world's caviar supply. Its caviar production during fiscal year 1957/58 (March 21, 1957, through March 20, 1958) was 162.5 metric tons as compared with 126.5 tons the previous year. Iran's exports of "caviar and caviar-like" products in 1958-59 totaled 159 tons valued at 160.9 million rials (US\$2.1 million), including U.S.S.R. 55 tons; France 39; United States 36; and Germany, 11 tons.

The most important fisheries enterprise in Iran is the Iranian Fisheries Company (Sherkat Sahami Shilat Iran), a Government agency. It was established in 1952 after the termination of the Iran-U. S. S. R. Fishing Company and has its headquarters at Tehran. Its main installations are at Bandar Pahlevi, a port city on the Caspian Sea. Until 1961, its authority was limited to the Caspian Sea and northern rivers fisheries, but in 1961, the Iranian Fisheries Company was granted jurisdiction over the Persian Gulf Fisheries.

The exploitation of fishery resources in the Persian Gulf began about 1955 with the organization of a joint venture between the Iranian Government and a Japanese company. That arrangement was subsequently terminated. As of May 1962, the Iranian Fisheries Company was seeking to establish a joint fisheries operation in the Persian Gulf with a foreign firm.

The shrimp fishery in the Gulf of Persia was substantially developed by a joint United States-Iranian company in 1958. (Economic Reports Part I, No. 62-48, U. S. Dept. of Commerce, May 1962).

Note: Value converted at rate of 75.75 rials equal US\$1.00.



Italy

FROZEN TUNA EXPORTED TO ITALY DIRECTLY FROM JAPAN:

A Japanese fishing firm is reported to have concluded a contract to export 148 metric tons of frozen yellowfin tuna to Italy from Japan proper at a c.i.f. price of \$380 per metric ton. Reportedly, this provides a very small margin of profit since about \$87 would have to be deducted for transportation expenses and brokerage fees.

In February this year, another Japanese fishing company exported a small quantity of frozen tuna from Japan proper to Europe. But the recent contract to export frozen yellowfin tuna to Italy is the first case of frozen tuna being exported from Japan proper to any European or African country in fiscal year 1962 (April 1962-March 1963). A third Japanese firm is reported to be negotiating a contract to export around 100 metric tons of frozen tuna to Italy, which it hoped to conclude by the end of July.

Practically all frozen tuna and tuna-like fish exported by Japan to Europe and Africa have been Atlantic-caught fish transshipped from Atlantic Ocean tuna bases. Frozen tuna were not exported from Japan proper to Europe and Africa in the past because of the high cost of transportation and also because of the high demand for the product in the United States, to the extent that the Japanese exporters were even transshipping much of the Atlantic-caught frozen tuna to the United States. However, exports of frozen tuna to the United States have recently begun to decline, whereas demand in Italy is firm. Therefore, it appears that frozen tuna exports from Japan proper to Europe and North Africa may likely increase hereafter, particularly since tuna catches in the Atlantic Ocean are reported to be declining.

Exports of frozen tuna to Italy during the first three months of the current fiscal year reportedly total approximately 6,000 metric tons. In fiscal year 1961, a total of 30,000 metric tons is reported to have been exported to Italy. (Suisan Keizai Shimbun, July 22, 1962.)

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INCREASE IN FROZEN TUNA IMPORT QUOTA REQUESTED:

According to reports received by the Japanese frozen tuna industry, the Italian Gov-

ernment has agreed to seek an increase of 15,000 metric tons in the duty-free import quota for frozen tuna, as requested by the Italian tuna packers. It plans to submit a request to the Common Market. This increase, if granted, would raise Italy's total duty-free import quota of frozen tuna from 25,000 metric tons to 40,000 metric tons.

The present 25,000-ton frozen tuna import quota for Italy was originally believed to have been established under pressure from France and other Common Market nations, but recent reports indicate that pressure from within Italy, particularly from Italian beef producers, had also played an important part in setting that quota. Therefore, if the Italian Government decides to increase the present tuna import quota, it is believed that its decision may likely be accepted by the Secretariat of the Common Market.

Japan annually exports between 25,000 to 30,000 metric tons of frozen tuna to Italy. Under the present 25,000-ton import quota for Italy set by the Common Market, Japanese frozen tuna exports to Italy are limited to 14,000 metric tons. Imports (for canning) exceeding that amount are dutiable at 7.5 percent ad valorem. Establishment of a 40,000-ton quota would mean that Japanese tuna producers would be able to increase their duty-free exports to Italy. (Suisan Tsushin, July 24; Suisan Keizai Shimbun, April 10, 1962.)

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FISHERY COOPERATIVES HAVE INFLUENTIAL ROLE IN ITALIAN FISHING INDUSTRY:

There are about 450 fishery cooperatives in Italy as compared with some 100 in the United States. The membership in the Italian organizations is about 120,000 or almost as many as all full-time and part-time fishermen in the United States.

Italian fishery cooperatives have functions beyond those of United States cooperatives. They manage wholesale fish markets in some areas, and even regulate fishing in territorial waters over which the government has assigned them jurisdiction. Italian fishermen's cooperatives are also involved in governmental assistance to fishermen in the form of family allowances, insurance benefits, and medical assistance.



Japan

CANNED TUNA IN BRINE SALES TO UNITED STATES:

The eighth sale to the United States of canned tuna in brine was approved at a July 20, 1962, meeting of the Tuna Sales Standing Committee, Japan Canned Foods Exporters Association. The Committee approved the sale of 250,000 cases, consisting of both white meat and light meat tuna, offered by the Canned Tuna Joint Sales Company which represents the packers. The Committee also approved a 20 cent per case increase for white meat tuna. Deliveries are to be completed by September 23, 1962.

Sale of Canned Tuna in Brine to U.S.		
Species	No. Cases	Price Per Case F.o.b. Japan
Tuna:	48 No. ½, 7-oz. cans	
White meat	150,000	US\$10.40
Light meat	100,000	7.80
Total	250,000	

Japanese export sales of canned tuna in brine up to and including the eighth sale total 1,743,000 cases, consisting of 968,000 cases of white meat tuna and 775,000 cases of light meat tuna.

The joint Sales Company reported as of July 1962 stocks of 500,000 cases each of canned white meat tuna and canned light meat tuna, a total of one million cases. (Suisan Tsushin, July 21, 1962.)

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EXPORTS TO U. S. OF CANNED TUNA IN BRINE, 1961:

Japan's exports to the United States of canned tuna in brine during January-December 1961 amounted to 2,218,857 standard cases (48 7-oz. cans), a 9-percent increase from the previous year's exports of 2,035,195 cases. The 1961 exports were up 74.3 percent for canned white meat tuna, but were down 51.8 percent for light meat, as compared with the previous year.

Japanese Export to the U.S. of Canned Tuna in Brine, 1956-61			
Year	White Meat	Light Meat	Total
1961 . . . . .	. . . (Standard Case - 48 7-oz. cans) . . .		
1960	1,711,607	507,250	2,218,857
1960	981,761	1,053,434	2,035,195
1959	1,004,824	1,058,422	2,063,246
1958	1,312,265	799,914	2,112,179
1957	1,166,111	563,748	1,876,013
1956	1,010,378	677,434	1,677,812

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CANNERS CONSIDER INCREASE OF CANNED WHITE MEAT TUNA EXPORT PRICES:

The Japan Export Tuna Packers Association was scheduled to hold a directors meeting on July 19, 1962, with discussions likely to center around the July sales of canned tuna. The discussion was to be concerned particularly with the problem of raising the export price of white meat tuna in brine. The early July 1962 price of white meat tuna was \$10.20 per standard case, f.o.b. Japan, but some of the canners were expected to urge a price increase of \$1 per case.

Reportedly, the price increase is being sought since the packers have had to pay high ex-vessel prices for summer albacore this year, with prices averaging 160 yen per kilogram (US\$403 a short ton), and also because of the low stocks of canned white meat tuna held on consignment by the Canned Tuna Sales Company. In addition, large-scale production of canned white meat tuna is not expected until the winter albacore season arrives. (Suisan Tsushin, July 14, 1962.)

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SHIZUOKA PACKERS CAN SKIPJACK TUNA FOR U. S.:

Shizuoka Prefecture packers in July were concentrating on packing skipjack tuna for export to the United States. Some of them had been canning tuna in oil, using small skipjack costing around US\$162 per ton. Judging from prices received for light meat (skipjack) in oil to Europe, it was believed it would be more profitable if less than \$125 per ton was paid for small skipjack. Production of tuna in oil was expected to be stepped up after the end of July. (Suisan Tsushin, July 5, 1962.)

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SKIPJACK TUNA EX-VESSEL PRICES MAKE CANNING UNPROFITABLE:

Heavy landings of very small skipjack tuna continued in late July 1962. Because of the small size of the tuna, the ex-vessel price of about 55 yen a kilogram (\$152 a metric ton) in Sanriku District barely allowed tuna canners to recover their packing costs. The higher ex-vessel skipjack price of about 60 yen a kilogram (\$166 a metric ton) in Shizuoka Prefecture was also described as unsatisfactory by canners.

Packers in the Sanriku District were concentrating on packing tuna in oil for export to

Japan (Contd.):

Europe because they had almost finished their tuna pack for export to the United States. (Japanese periodical, August 3, 1962.)

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ALBACORE AND YELLOWFIN TUNA PRICES FOR EXPORTS TO UNITED STATES:

Yellowfin tuna fishing in the Eastern Pacific as of July 1962 was still light, reports the Japanese periodical *Suisan Keizai Shim bun* of July 16, 1962. Also, the United States landings of albacore tuna in the 1961 season did not meet the demand by United States canners. The periodical explains that accelerated buying of frozen tuna in Japan by United States packers during the last half of 1961 caused Japanese export prices for frozen tuna to rise.

Month	Japanese Average f.o.b. Prices for Licensed Frozen Tuna Exports to United States by Months					
	Albacore (Round)			Yellowfin (Gilled and Gutted)		
	1962	1961	1960	1962	1961	1960
January	379	278	1/	330	248	1/
February	360	281	1/	322	259	1/
March	362	281	1/	340	259	1/
April	365	297	1/	340	260	1/
May	374	300	1/	348	264	1/
June	1/	315	296	2/350	266	257
July	1/	322	309	1/	265	259
August	1/	340	312	1/	271	246
September	-	356	283	-	288	239
October	-	376	277	-	312	240
November	-	389	276	-	318	236
December	-	389	272	-	326	244

¹/Not available.²/To June 15.

According to the average price of licensed Japanese exports of frozen tuna to the United States, the price of round albacore rose steadily since the fall of 1961. In November and December the price advanced to \$389 a short ton f.o.b., which was \$100 higher than at the beginning of 1961. At the start of 1962, prices began to decline and in February the albacore price dropped to \$360 a ton. Later, there was a gradual upward price trend and by May the price had climbed to an average of \$374 a ton.

In contrast, prices for gilled and gutted yellowfin tuna had been advancing since last year and in June 1962 were at an unprecedented high average \$350 a short ton. As compared with albacore, prices for yellowfin tuna through July this year remained firm.

Japan's export prices of frozen tuna to the United States are generally low in February and March each year due to light demand from the United States, and those months are usually referred to as a "weak period." In the case of yellowfin, however, such a trend was completely reversed this year and the price remained at a high level throughout the so-called "weak period."

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FROZEN TUNA APPROVED FOR EXPORT TO UNITED STATES:

The following quantities of frozen tuna, by species, were approved for export to the United States from Japan proper in Fiscal Year 1961 (April 1961-March 1962):

Product	Quantity Short Tons
Albacore, round	27,733
Albacore, other	1,267
Yellowfin, gilled and gutted	29,060
Yellowfin, other	8,366
Total	66,426

About 95 percent of the 66,426 tons was earmarked for some 12 principal United States buyers. (*Suisan Tsushin*, July 19, 1962.)

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TUNA AND SWORDFISH EXPORTS, CALENDAR YEARS 1956-60:

Japan's total exports of frozen and fresh (mostly frozen) tuna and broadbill swordfish (direct shipments and transshipments) during calendar year 1960 amounted to 124,741 actual tons (equal 125,538 metric tons), valued at \$34.2 million. Japanese tuna exports that



A worker filleting a yellowfin tuna aboard a Japanese tuna mother ship.

Japan (Contd.):

Japanese Frozen Tuna and Broadbill Swordfish Exports, 1956-1960

Species	Year	Quantity		Total Value
		Actual ¹ / Tons	Metric ² / Tons	Million US\$
<u>Direct Shipments:</u>				
Albacore	1960	25,185	24,187	7.7
	1959	24,760	24,761	8.5
	1958	22,127	20,760	7.0
	1957	34,966	36,188	10.6
	1956	22,012	21,043	8.2
Yellowfin	1960	31,054	31,609	8.4
	1959	34,999	35,743	9.0
	1958	46,620	45,709	12.4
	1957	30,906	33,420	7.7
	1956	32,501	31,078	7.3
Skipjack	1960	138	125	4/
	1959	1,204	1,092	0.2
	1958	2,711	2,475	0.5
	1957	21	23	4/
	1956	3/	3/	4/
Big-eyed	1960	90	88	4/
	1959	1,275	1,467	0.4
	1958	3,163	3,289	0.8
	1957	661	698	0.2
	1956	570	554	0.1
Other Tuna	1960	276	293	0.1
	1959	-	-	-
	1958	116	109	4/
	1957	254	244	0.1
	1956	322	293	0.1
Total Tuna	1960	56,743	56,302	16.2
	1959	62,238	63,063	18.1
	1958	74,737	72,342	20.7
	1957	66,808	70,573	18.6
	1956	55,406	52,969	15.7
Broadbill Swordfish	1960	5,168	6,713	3.3
	1959	4,797	6,234	2.5
	1958	5,075	6,585	3.3
	1957	4,132	6,263	2.8
	1956	6,041	8,417	3.7
Total Direct Shipments	1960	61,911	63,015	19.5
	1959	67,035	69,297	20.6
	1958	79,812	78,927	24.0
	1957	70,940	76,836	21.4
	1956	61,447	61,386	19.4
<u>Transshipments:</u>				
Albacore:	1960	8,017	7,273	2.2
	1959	1,509	1,369	0.5
	1958	383	347	0.1
Yellowfin:	1960	14,025	14,137	3.2
	1959	14,644	14,764	3.4
	1958	5,091	5,142	1.2
Tuna (to Europe)	1960	40,788	41,113	9.3
	1959	22,499	22,678	5.1
	1958	10,846	10,942	2.4
	1957	11,483	11,562	2.6
Total Transshipments	1960	62,830	62,523	14.7
	1959	38,655	38,811	9.0
	1958	16,320	16,431	3.7
	1957	11,483	11,562	2.6
Grand Totals	1960	124,741	125,538	34.2
	1959	105,690	108,108	29.6
	1958	96,132	95,358	27.7
	1957	82,423	88,398	24.0
	1956	61,447	61,386	19.4

¹/Includes short tons and metric tons of actual shipment of products.²/Converted to round fish in metric tons.³/Less than 5 tons.⁴/Less than US\$1,000.

year totaled 118,825 metric tons valued at \$30.9 million (direct shipments 56,302 tons valued at \$16.2 million, and transshipments 62,523 tons valued at \$14.7 million).

The 1960 Japanese tuna exports were up 16.6 percent from the previous year and the value increased 14 percent. Most of the increase was in Japan's transshipments, which were up 61 percent in 1960 as compared with 1959. The larger proportion of the transshipments were to Europe.

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EX-VESSEL TUNA PRICES IN TOKYO:

The following ex-vessel prices were paid on July 13, 1962, for 241 metric tons of frozen tuna and tuna-like fish landed in Tokyo by the Oasa Maru No. 8.

Product	Price	
	Yen/Kg.	\$/Short Ton
Yellowfin (round):		
Special lge. (over 120 lbs.) . . .	88.0	222
Large (100-120 lbs.)	115.7	292
Medium (80-100 lbs.)	127.4	321
Small (20-80 lbs.)	128.4	324
Fillets:		
Yellowfin	115.7	292
Big-eyed	100.2	253

The Oasa Maru No. 8 operated in the eastern Pacific Ocean in the vicinity of 100° W. longitude between 3° N. and 3° S. latitude. (Suisan Keizai Shimbun, July 15, 1962.)

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FROZEN TUNA EX-VESSEL PRICES AT TOKYO, AUGUST 10:

The following ex-vessel prices were paid on August 10, 1962, for about 500 metric tons of frozen tuna and spearfish landed at Tokyo



Frozen tuna at Tokyo Wholesale Fish Market.

Japan (Contd.):

by three Japanese tuna long-line vessels, reports the August 12, 1962, issue of the Japanese periodical Suisan Keizai Shimbun.

Frozen Tuna Ex-Vessel Prices at Tokyo, August 10		
Product	Price	
	Yen/kg.	\$/Short Ton
Yellowfin (gilled & gutted):		
Special lge. (over 120 lbs.) .	90	227
Large (100-120 lbs.)	100-120	252-302
Medium (80-100 lbs.)	110-120	277-302
Small (20-80 lbs.)	115-120	290-302
Albacore (round)	138	348
Fillets:		
Yellowfin	115	290
Big-eyed	112-115	282-290

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SKIPJACK TUNA LANDINGS AT YAIKU:

Skipjack tuna fishing in inshore waters off Japan as of early July 1962 was good. Landings exceeding 300-400 metric tons were reported daily at Yaizu (Japan's most important tuna port). Early in July, this year's highest landings of 585 tons of skipjack were reported and the market had a liberal supply of that species.

The fishing area was from Zenisu Bank to Miyakejima Island, near enough to the coast for the fishermen to make a trip in two days with a catch of 20-30 tons a day. This type of fishing was expected to last until mid-July.

Landings of skipjack at Yaizu from April through the latter part of June totaled 12,173 tons worth US\$2.6 million ex-vessel. At the same time last year, 1,935 tons (valued ex-vessel at \$175,799) more skipjack were landed. Landings at the beginning of June were up, with schools near the shore. By the latter half of June, 6,234 tons, valued at \$1.2 million, were landed (3,637 tons worth \$718,475 were landed at the same time last year). The fishing was so good that some 30 skipjack vessels came into port every day with full loads. (Japanese periodical, July 7, 1962.)

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YAIZU FISHERY LANDINGS,
JANUARY-JUNE 1962:

A total of 72,988 metric tons of fish valued at US\$20.2 million was landed at Yaizu (leading Japanese tuna fishing port) in the first half of this year. This was 159 tons and \$1.3 million more than in the same period of 1961.

Landings in June were 4,970 tons (value \$1,570,839) of tuna other than skipjack and 9,498 tons (\$1,807,819) of skipjack. The port's total June landings were 17,057 tons, valued at \$4.2 million. June 1962 landings surpassed the record for the same month last year by 2 percent in quantity and 3 percent in value. Skipjack landings in June 1961 were only 4,894 tons, valued at \$1.1 million. While skipjack landings this June were so much more than last year, albacore tuna landings were not even one-third of last year's landings.

Table 1 - Yaizu Fishery Landings, Principal Species, January-June 1962 with Comparisons

Species	Quantity		Value	
	1962	1961	1962	1961
(Metric Tons) . . (US\$1,000) ..				
Albacore tuna	10,266	14,009	4,018	4,397
Skipjack tuna	16,118	12,653	3,367	2,907
Other tuna	34,166	34,753	11,352	10,061
Mackerel	8,488	7,806	791	945
Others	3,950	3,608	671	607
Total	72,988	72,829	20,199	18,917

Table 2 - Summer Albacore Tuna Landings at Japanese Port of Yaizu, March-June 1962 with Comparisons

Month	1962	1961
(Metric Tons) . .		
June	1,576	5,253
May	2,758	3,512
April	1,269	1,215
March	1,801	1,266

Usually summer albacore landings keep the Yaizu fish market busy from the beginning through the middle part of summer. Landings usually taper off in mid-July or the beginning of August at the latest. This year the season ended about mid-July, with landings light throughout the season. Each year the peak of the season is in June and landings continue well into the beginning of July. Things were different this season, in the beginning of July, landings amounted to only a few tons a day up to the 5th of the month. In June, total albacore landings were 1,576 tons, while last year when fishing was considered only fair, 5,213 tons were landed. There has been no record of landings of less than 2,000 tons in any June in past years. Records of the past 7 years show the following landings of albacore tuna at Yaizu: 5,200 tons in 1961, 5,800 tons in 1960, 2,200 tons in 1959, 5,500 tons in 1958, 9,300 tons in 1957, 7,200 tons in 1956, and 2,400 tons in 1955. While 200 or 300 tons of albacore are landed daily during the peak of the season in June, this year good skipjack fishing was found in inshore waters and around the Bonin Islands at the end of May and fishing vessels normally fishing albacore concentrated on skipjack. This resulted in unprecedented light landings of summer albacore.

Catch of albacore was normal March through April, but in May light landings became conspicuous. In June, summer albacore fishing almost ended affected by good skipjack fishing.

Oceanic conditions too were not exactly suitable for albacore fishing, with the boundary of the Black and Kurile Currents less definitive than usual. (Suisan Keizai Shimbun, July 14 and 16, 1962.)

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TUNA FISHING CONDITIONS OFF HOME ISLAND, EARLY JULY 1962:

As of July 10, 1962, fishing for skipjack tuna in Japanese waters was reported good off northeastern Japan about 120-140 nautical miles to the east and southeast of Kinkazan, Miyagi Prefecture. Several vessels were reported to have caught from 30-40 metric tons a day. Off central Japan, skipjack fish-

Japan (Contd.):

ing slowed down, although fishing was reported still fair off Cape Omaezaki, Shizuoka Prefecture.

Landings of skipjack at Yaizu July 1-10 totaled 3,260 metric tons. Ex-vessel prices firmed up somewhat during the month, with high of 145 yen per kilogram (\$US\$365 a short ton) and low of 46 yen per kilogram (\$116 a short ton) being paid for 383 metric tons landed on July 10. On July 9 a high of 135 yen per kilogram (\$340 a short ton) and low of 42 yen per kilogram (\$106 a short ton) were paid for 685 metric tons of skipjack landed on that day. Compared to those prices, in late June skipjack sold for a high of 120-125 yen per kilogram (\$302-315 a short ton).

According to data published by the Fisheries Agency, a near record 9,498 metric tons of skipjack were landed at Yaizu for the month of June. However, for the same month skipjack landings at the five principal ports in Miyagi Prefecture in northeastern Japan (Kesennuma, Shiogama, Ishinomaki, Onagawa, and Watanoha) totaled 15,590 metric tons, or 4,268 metric tons less than in June 1961, according to press reports. With the shift in skipjack fishing to the waters off Miyagi Prefecture, early July landings of skipjack at the five ports were reported to have picked up considerably.

Albacore fishing was still very poor and incidental catches of about 100 albacore a day were reported by the pole-and-line skipjack fleet. The few albacore that were landed at Yaizu brought ex-vessel prices ranging from 150 to 165 yen per kilogram (\$378-416 a short ton).

Landings of skipjack and albacore tuna for the five-year period of 1958 to 1962 April-June are shown in tables 1 and 2. (*Suisan Keizai Shimbun*, July 13, 1962, and other sources.)

Table 1 - Skipjack Tuna Landings at Yaizu, April-June 1958-62

Year	April	May	June	Total
..... (Metric Tons)				
1962	997	4,971	9,498	15,466
1961	1,953	4,647	5,894	12,494
1960	2,000	3,258	3,241	8,499
1959	3,352	8,465	10,400	22,217
1958	2,437	6,362	4,143	12,942

Table 2 - Albacore Tuna Landings at Yaizu, April-June 1958-62

Year	April	May	June	Total
..... (Metric Tons)				
1962	1,271	2,738	1,577	5,586
1961	1,215	3,512	5,253	9,980
1960	911	4,516	5,802	11,229
1959	428	791	2,184	3,403
1958	1,228	2,361	5,478	9,067

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TUNA QUOTAS INCREASED FOR MOTHERSHIPS AND CERTAIN OVERSEAS BASES:

Increases in tuna production quotas for the overseas-based fisheries and the mothership-type tuna fishery for FY 1962 (April 1962-March 1963) were announced by the Japanese Fisheries Agency on August 3, 1962.

The 6,000-ton quota increase for American Samoa was allocated only to the one Japanese fishing company, which submitted an application earlier this year to engage in

tuna fishing from that Island. Two other Japanese fishing firms, which are currently delivering tuna to the cannery (operated by a United States west coast tuna canning firm) at Samoa, were not granted any quota increase. The quotas for those two firms are: 8,000 tons and 4,000 tons. This gives American Samoa a total quota of 18,000 short tons.

Japanese Tuna Quotas for Motherships and Certain Overseas Bases			
	FY 1962	FY 1961	Increase
Espirito Santo, New Hebrides . . . . .	..... (Short Tons)		
American Samoa	6,000	4,000	2,000
Penang, Malaya	18,000	12,000	6,000
Mothership-type tuna fishery	6,000	6,000	-
	..... (Metric Tons)		
	27,000	22,900	4,100

Production quotas were not allocated to the tuna base planned for Levuka, Fiji Islands, under the so-called Matsuda Plan, or to the proposed tuna bases at Tahiti and New Caledonia. However, the Agency announced that it has established a special provision in the law whereby overseas bases can be licensed if they meet the conditions newly-established by the Agency. Based on this special provision, the Agency is reviewing the application submitted by Japanese firms seeking approval to establish fishing bases at Tahiti, Fiji Islands, and New Caledonia, and it is reported that the Agency is likely to authorize a production quota of around 2,000-3,000 tons for the Fiji Islands tuna base. (*Suisan Tsushin*, August 1, 4, and 8, 1962.)

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FISHERIES AGENCY REQUESTS VESSELS TO SUBMIT YELLOWFIN TUNA CATCH DATA:

The Japanese Government, which recently pledged its cooperation in submitting Japanese tuna catch data for the eastern Pacific Ocean, has instructed the National Federation of Japan Tuna Fisheries Cooperative Associations and the Japan Tuna Fishermen's Association to submit to the Fisheries Agency catch data on all yellowfin tuna taken from the eastern Pacific Ocean within the Inter-American Tropical Tuna Commission proposed area of regulation. Data to be reported to the Fisheries Agency are:

1. Quantity (in number) and weight of yellowfin tuna, and amount of other species of fish taken from within the regulatory area after January 1962 and landed before July 31, 1962, on a trip basis. Vessels fishing within the proposed regulatory area, but which have

Japan (Contd.):

not returned to their home ports as of July 31, will report this same information.

2. Quantity (in number) and weight of yellowfin and amount of other species of fish landed during each month after August 1, 1962. However, in cases where a vessel trip extends to the following year or if fishing was done partly outside the proposed regulatory area, a monthly report showing the quantity and species of tuna taken from within the proposed regulatory area shall be filed. In addition, a report showing the catch for the entire trip must be filed.

3. Catch data for the period up to July 31, 1962, will be submitted to the Fisheries Agency by August 15, and the monthly data for the period after August 1 must be filed with the Agency by the tenth of the following month. (Suisan Keizai Shimbun, August 3, 1962.)

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RESEARCH VESSEL TO SURVEY EASTERN PACIFIC OCEAN TUNA RESOURCES:

The Japanese Fisheries Agency's research vessel Shoyo Maru (602 gross tons) is scheduled to conduct a survey of tuna resources in the eastern Pacific Ocean from mid-October of this year. The Shoyo Maru is expected to survey the waters to the west of the area fished by the United States purse-seine fleet but within the United States-proposed regulatory area for yellowfin tuna, as well as the waters south of the proposed regulatory area, that is south of 30° S. latitude. (Suisan Keizai Shimbun, July 4, 1962, and other sources.)

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RESEARCH VESSEL INVESTIGATES ALBACORE SCHOOLS IN NORTH PACIFIC:

The Tokai Daigaku Maru, a 190-ton training and research vessel of Tokai University, returned to a Japanese port about the end of June, from a 25-day voyage to investigate small and medium albacore tuna in waters east of 140° east longitude.

The University's research scientists aboard the vessel conducted investigations to substantiate the theory of finding more schools of small and medium-fish in more northerly sections of the Pacific. Although such schools were found, the strength of the Kurile Current thrusting into the Black Current running eastward was not strong enough this year.

Because of this, the area where the two currents mingled was not definitive enough for the fish schools to linger. This failed to bring about the expected results.

The vessel took a course moving northward along the Izu Seven Islands to 30° north latitude, then eastward to 150° east longitude. The investigations were repeated around 33°-34° north latitude, 147°-148° east longitude. Albacore schools were discovered around 34° north latitude, 142° east longitude, but were lost sight of after hooking a few fish. (Suisan Keizai Shimbun, June 30, 1962.)

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VESSELS OPERATING IN SOUTH ATLANTIC TUNA FISHERY, JULY 1962:

As of early July 1962 there were 68 Japanese vessels operating in the South Atlantic tuna fishery as compared with 69 in May, 77 in April, and 80 in March. The number fishing in that area since March 1962 has been declining steadily. The daily catch per boat on the average was 4-5 metric tons of fish--considered only fair fishing.

The peak of the yellowfin tuna season in the Atlantic lasted for the seven months period March-September, from 1957 through 1960. Last year, however, yellowfin fishing took a turn for the worse in July and the so-called big-eyed fishing season began. Based on the results of the vessels through early July, the peak of the yellowfin season was expected to end earlier this year than last year, and the big-eyed fishing season might have actually begun in June. The catch ratio this year was some 40 percent big-eyed to 60 percent yellowfin. Depending upon the location of vessels, this was not much different from last year's July-August season. However, since this year the export price of big-eyed tuna has advanced, this year's operation seems more profitable than last year's.

The Japanese industry and Government are considering ways and means to cope with the extremely poor tuna fishing in the South Atlantic. Six years have elapsed since a new fishing ground was developed in the South Atlantic in 1958. Since then there has been a decline in catch ratio and catch per day. This drop in yield has not been encountered only in the Atlantic, but also in the Indian Ocean and Pacific. But the decline has been more pronounced in the Atlantic.

The recent catch rate in the South Atlantic is said to be 8,300-12,400 pounds per day by the 240-ton-class tuna vessels as compared with 24,800-33,100 pounds per day in 1960 when fishing was good. From the standpoint of management, the catch yield causes the operation to only just about break even.

The poor fishing for Atlantic tuna is curtailing exports to Italy. Because the Italian Government has limited frozen tuna imports to 25,000 metric tons, some tuna interests in Japan see no necessity of concentrating on exports to Italy as there are a number of other countries wanting to import Japanese tuna. (Suisan Keizai Shimbun and Suisan Tsushin, July 6, 1962.)

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RESEARCH VESSEL TO EXPLORE FOR TUNA IN SOUTH ATLANTIC OCEAN:

In order to find new fishing areas for the Japanese tuna fleets, the Japanese Fisheries Agency is planning to dispatch the research

Japan (Contd.):

vessel Shoyo Maru (603 gross tons) to the South Atlantic Ocean next year. The tuna fleets, yearly, are extending their range of operations to distant waters.

The Shoyo Maru is scheduled to depart Japan on September 23, 1963, and is expected to arrive at the fishing grounds off the coast of West Africa on November 4, where it will conduct initial exploratory fishing until November 29. The vessel will then call at Luanda, Angola, from where it will proceed to Rio de Janeiro, Brazil, and resume exploratory operations in the southwest Atlantic Ocean. The Shoyo Maru is scheduled to return to Japan by way of the Panama Canal on March 31, 1964. (Suisan Keizai Shimbun, August 8, 1962.)

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NEW ALBACORE TUNA AREAS IN ATLANTIC DISCOVERED:

As of mid-July 1962, a total of 81 Japanese tuna long-line vessels were reported to be fishing in the Atlantic Ocean, or 13 more vessels than in June. A number of these vessels are said to have conducted exploratory fishing in the waters nearby Puerto Rico, described as new fishing areas, and found good fishing for albacore. Reportedly, they are catching about 4 metric tons of albacore per day.

The Japanese Atlantic tuna vessels appear to be placing great hopes on the new albacore areas. In the past, albacore fishing has proven to be slow throughout the Atlantic at that time of the year. The albacore areas normally fished by the Japanese are located off Brazil, but this fishery does not begin until the fall season. (Suisan Tsushin, July 27, 1962, and other sources.)

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ADDITIONAL TUNA VESSEL TONNAGE:

The allocation of a 20,000-ton increase in tuna vessel tonnage to be used in the next two years for the construction of tuna vessels as replacements for fishing vessels to be withdrawn from the depressed fisheries was announced by the Japanese Fisheries Agency on August 3. Vessels to be constructed will total approximately 200 vessels, primarily under 100 tons gross. Present size of the tuna fleet, in terms of total gross tonnage, is nearly 248,000 gross tons.

Additional Vessel Tonnages Allotted to Different Japanese Fisheries	
Fishery	Allocated Tonnage
Salmon	10,500
Coastal	3,000
Trawl	3,000
Surrounding net	1,500
Tuna	1/2,000
Total	20,000
1/To be allocated to tuna vessel owners who are planning to construct vessels larger than 99 gross tons.	

The additional tonnages allotted to the different Japanese fisheries for the construction of new tuna vessels are as shown in the table. (Suisan Keizai Shimbun, August 4, 1962.)

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CHANGES SOUGHT IN REGULATIONS ON PORTABLE-VESSEL-CARRYING TUNA MOTHERSHIP-TYPE OPERATIONS:

The Japanese Fisheries Agency in August 1962 was studying applications submitted by four large fishing companies which hope to operate portable-vessel-carrying tuna motherships solely as carriers and to employ for fishing purposes only the catcher vessels carried by the motherships. This type of operation differs with the existing portable-vessel-carrying mothership-type operation in that the mothership will not engage in fishing.

Purpose of this plan is to circumvent restrictions on construction of large tuna vessels. At the present time, existing tuna vessels of certain prescribed tonnages must be retired from the tuna fishery before larger tuna vessels of specific sizes can be constructed in their places. Under the plan proposed by the large fishing companies, the large tuna vessels carrying portable catcher boats would not directly engage in fishing but serve as carriers, which do not require tuna licenses. Thus, being "carriers" and not "fishing vessels," they would be exempt from existing restrictions governing construction of large tuna vessels.

Reportedly, two of the firms are planning to operate 3,700-ton tuna motherships, each carrying eight portable fishing vessels. The other two are reported to be planning on operating tuna motherships carrying 8-10 portable vessels, which they hope to dispatch to the Indian Ocean.

At present, a total of 23 large fishing vessels are licensed as portable-vessel-carrying tuna motherships, the largest of which is

Japan (Contd.):

the Kuroshio Maru No. 21 (1,900 gross tons), which carries six portable vessels. (Shin Suisan Shimbun, August 13, 1962.)

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**TUNA FISHING VESSEL TESTS
POWER BLOCK:**

The first power block ever to be used in Japan was reported to have been installed this summer on a large surrounding net (probably purse seine) vessel belonging to a large fishing company. This hydraulic power block was imported from the United States and was installed on the tuna vessel Kenyo Maru (240 gross tons) at a cost of about 3 million yen (US\$8,333).

Immediately after installation of the power block, the Kenyo Maru departed for the skipjack fishing grounds off the coast of northern Japan to test its efficiency.

The Japanese Fisheries Agency and the Japanese fishing industry reportedly are conducting studies on the possibilities of adopting power blocks and on improving vessel designs and fishing nets in an effort to increase further the operational efficiency of surrounding-net gear. The Government has already appropriated a sum of 2,080,000 yen (US\$5,800) for FY 1962 (April 1962-March 1963) aimed at studies to improve the efficiency of surrounding nets used by fishing vessels operating out of Nagasaki.

The Agency has for some time urged the Japanese surrounding-net industry to study the actual operations of efficient United States purse seiners employing power blocks. At a recent meeting of the North Pacific Ocean Surrounding Net Fishery Council held in Aomori Prefecture in northern Japan, the Council members urged that a group of Japanese vessel owners be sent to the United States to observe the operations of United States purse seiners, and a tour has been tentatively organized, with plans to send one fishery cooperative member each from Aomori, Iwate, Miyagi, Fukushima, Ibaraki, and Chiba Prefectures. Arrangements for overseas travel and other administrative affairs related to this tour are to be handled by the Japan National Federation of Fishery Cooperatives. (Suisan Keizai Shimbun, July 25, and August 8, 1962.)

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**TUNA COMPANY TO BE
ESTABLISHED BY COOPERATIVE:**

The Japan National Federation of Fishery Cooperatives (ZENGYOREN) early in August reportedly was planning on forming a tuna fishing company to conduct tuna fishing in the South Pacific Ocean. The president of the firm and the directors are said to have approached the Fisheries Agency Director to seek Government approval and support for their plan. But the Agency has made it clear that it does not intend to approve such a plan.

Under the original plan, the company would be assigned 30 tuna vessels (99 tons each), the construction of which the Fisheries Agency is expected shortly to authorize under the Government's plan to promote the coastal fishery cooperatives in 15 prefectures (at the rate of two vessels per prefecture), in line with the Government's over-all plan to increase the total authorized tuna vessel tonnage in Japan by 20,000 tons in the next two years. The Federation contends that if each prefectoral fishery cooperative forms its own separate organization to operate the newly-licensed 99-ton tuna fishing vessels, they will all certainly run into operational and financial difficulties. Therefore, to insure effective utilization of these 30 tuna vessels, the Federation would organize, above the prefectoral cooperatives, a central company to operate the 30 vessels. The central company would enter into a contract with a large fishing company to engage in joint tuna fishing, whereby the Federation would provide the catcher vessels and the large fishing company the mothership. Several large Japanese fishing firms were reported to be interested in entering into an agreement on this basis with the Federation, which reportedly had asked for a production quota of 5,000 metric tons of tuna for export purposes. (Minato Shimbun, July 17; Nihon Suisan Shimbun, July 23, 1962.)

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**NATIONAL COOPERATIVE SCHEDULES
MEETING TO STUDY USE OF
ITS TUNA VESSELS:**

The Japan National Federation of Fishery Cooperatives (ZENGYOREN) was scheduled to meet in Tokyo on August 17 to discuss the use of the 30 tuna vessels (99-tons each) newly-licensed to its 15 regional fishery cooperatives (2 vessels per cooperative). ZENGYOREN had originally hoped to utilize the 30 vessels in the tuna mothership fishery, with the mothership to be provided by a large fishing company. However, the Fisheries

Japan (Contd.):

Agency does not intend to license such a venture, so the August 17 meeting was scheduled to study other ways and means of most effectively using the 30 tuna vessels.

The key question to be resolved at the meeting is whether each regional cooperative should independently operate its two tuna vessels or whether ZENGYOREN should form a central organization to operate the 30 vessels belonging to the regional cooperatives. (Suisan Tsushin, August 15, 1962.)

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LONG-LINE VESSELS REACH SALMON CATCH GOAL SOUTH OF 45° N. LATITUDE:

The Japanese land-based long-line fleet of about 369 vessels fishing for salmon off Eastern Hokkaido south of 45° N. latitude (Area B) stopped fishing on June 25, 1962, five days earlier than usual. The fleet had attained its catch goal of 10,000 metric tons. The fleet reported unexpectedly good fishing. In 1961, the salmon catch by the long-line fleet in Area B amounted to about 14,000 tons.

The over-all salmon catch quota for both long-line and gill-net vessels in Area B this year was 60,000 tons, a reduction of about 20,000 tons from the previous year's quota. In 1962, Area B was added to the area regulated by the Japan-Soviet Northwest Pacific Fisheries Convention (Japanese newspaper, July 4, 1962).

Ex-vessel prices for the long-line salmon on catch in Area B in 1962 were as follows:

Species	Value	
	U.S.\$/Metric Ton	U. S. Cents/Pound
Salmon, fresh . . .	729	33.1
Trout, fresh	603	27.3
Salmon, salted . . .	754	34.2
Trout, salted . . .	528	23.9

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SALMON MOTHERSHIP FLEETS IN NORTH PACIFIC REACH CATCHQUOTA:

Japanese press reports indicate that the 11 Japanese salmon mothership fleets in North Pacific had reached their catch targets and were expected to return to Japan by August 2, 1962. Two of the first motherships to return to Japan were the Chiyo Maru (7,653 gross tons) and Miyajima Maru

(9,598 gross tons)--they arrived in Hakodate on July 25.

According to press reports, red salmon was estimated to make up 60 percent of the total catch of the 11 fleets. This season's catch by species was estimated to be: red salmon 26,000 metric tons, chum 15,000 tons, pink 2,000 metric tons, and silver 1,500 tons. The catch quota for the salmon mothership fleets this year was 44,665 metric tons.

Reportedly, several factors stood out in this year's operation: the abundance of red salmon of Asian origin; lack of red salmon of Bristol Bay origin; lack of pink salmon; and abundance of silver salmon towards the latter part of the fishing season. The 11 fleets were reported not to have operated in the eastern area (towards the abstention line) but concentrated their operations to the west this year. (Suisan Keizai Shimbun, July 20, Hokkai Suisan, July 30, 1962, and other periodicals.)

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FROZEN HALIBUT EXPORT PRICES STEADY:

Japanese exports of frozen halibut to the United States were comparatively good in June, according to translations of articles from Japanese periodicals. Export prices during that month were officially quoted at 45-47 U. S. cents a pound, c.i.f. the United States east coast.

Ex-vessel halibut prices in Japan were reported to be 160-170 yen per kilogram (20.1-21.4 cents a pound). (Suisan Tsushin, July 21; Shin Suisan Shimbun Sokuho, July 20, 1962.)

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BERING SEA HALIBUT LANDINGS:

The Japanese bottom fishing fleets in the Bering Sea were reported to have already caught a total of 8,000 metric tons of halibut as of June this year, according to a translation from the Japanese periodical Suisan Tsushin of July 21, 1962. It was reported that by the end of the 1962 fishing season, landings of 12,000 tons of halibut may be reached.

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KING CRAB OPERATIONS IN BRISTOL BAY:

The Tokei Maru crab fishing fleet, jointly operated by two Japanese fishing firms, was

Japan (Contd.):

reported to have left its fishing ground in Bristol Bay early in July 1962. The fleet completed its production target of 60,000 cases of canned crab meat and was returning to Japan.

The Dainichi Maru crab fishing fleet, under the joint management of two other Japanese fishing firms was expected to attain its production goal of 70,000 cases in the middle of July. (Suisan Keizai Shimbun, July 3, 1962.)

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GOVERNMENT ISSUES FALL KING CRAB FISHING LICENSES AND REGULATIONS:

Eight Japanese fishing firms planning to operate jointly two king crab mothership fleets in the eastern Bering Sea this fall were issued licenses on July 30, 1962, by the Fisheries Agency. Four firms will operate jointly the mothership Ishiyama Maru (5,630 gross tons) and the other four will operate jointly the mothership Shinyo Maru (5,632 gross tons).

The Ishiyama Maru fleet, which consists of 8 catcher vessels, was scheduled to depart Hakodate on August 5. The fleet's catch quota is 400 metric tons of king crab. The Shinyo Maru fleet, which was scheduled to depart on August 10, will consist of 4 catcher vessels and 4 "Kawasaki" (portable launch-type) vessels, each of 20 tons gross. The Shinyo Maru's production quota is 350 metric tons of king crab. Both fleets are reported to be planning on producing frozen "discs," described as crab meat which has been processed and prepared for immediate canning at shore installations.

The Fisheries Agency has issued the following regulations concerning the fall king crab operations:

1. Fishing season will be from August 1 to November 30.

2. The following areas will be closed to fishing: Area formed by a line drawn from Unimak Island north along 164° W. longitude to the points 56° N., 164° W., 56° 20' N.-163° W., 57° 10' N.-163° W., and 58° 10' N.-160° W., and south along 160° W. longitude to the Alaska Peninsula.

3. Possession and/or use of gear other than crab tangle nets are prohibited.

4. Capture of female crabs and of crabs measuring less than 13 centimeters (5.1 inches) in carapace width is prohibited. However, such crabs may be taken incidentally in the catch if they do not average more than one crab per "tan" (shackle) of net set by a vessel.

5. Fishing vessels must not refuse to allow foreign officials, who have been properly authorized under international fisheries agreement, to inspect and search their vessels. Vessels that have been subjected to inspection and search must promptly report to the Fisheries Agency.

6. Operational instructions deemed necessary and, therefore, issued by the Fisheries Agency inspector must be complied with.

7. The outfitting of motherships and catcher vessels may be restricted, when necessary, to regulate fishing operations.

8. Vessels engaged in the transportation of catches and processed products must be equipped with radio and direction finders.

9. Products to be unloaded at port of landing will be counted by an inspector and a certificate showing quantity will be issued, which must be submitted to the Fisheries Agency. (Suisan Keizai Shimbun, July 31; Suisan Tsushin, July 5, 1962, and other periodicals.)

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LANDINGS OF FISHERY PRODUCTS IN 1961:

According to a preliminary report, Japan's total landings (excluding whaling operations) in the 1961 calendar year amounted to 6,710,000 metric tons--a new record and 8.4 percent more than the previous year's landings of 6,190,000 metric tons.

Type of Fishery	1961 .. (1,000 Metric Tons) ..	1960 6,280 280 80 20 6,190
Marine landings	6,230	
Shallow-water	320	
Fresh-water	90	
Other aquatic products	20	
Total landings	6,710	

¹/Does not include whaling.

Marine landings accounted for 93.6 percent of the total catch in 1961. The flatfish catch by the mothership fleets in the North Pacific showed a substantial gain in 1961.

Catches in 1961 by mothership-type trawling, gill-netting, long-lining in "northern waters" (North Pacific and Bering Sea) were up 180,000 tons from 1960. A recovery in the mackerel pike dip-net fishery (landings up 190,000 tons), and better catches in the skipjack hook-and-line fishery (landings up 60,000 tons) contributed to the gain in total landings.

A number of vessels were added to the tuna fleet in 1961 and new tuna fishing grounds were also developed. In spite of the increase in fishing effort, the tuna long-line catch showed only a modest increase. Landings by tuna long-liners operating out of Japanese ports were up 30,000 tons and the catch of long-liners in the Atlantic was up 10,000 tons.

In 1961, some 20,000 large whales (an increase of some 1,000) and 950 small whales (an increase of some 160) were caught by Japanese whaling operations. (Japanese news-paper, June 20, 1962.)

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SALMON INDUSTRY URGES END OF ABSTENTION PRINCIPLE:

The Special Committee on Tripartite (Canada, Japan, United States) Fisheries Problems, organized by the Japan Fisheries Society, held its first meeting on August 9, 1962,

Japan (Contd.):

and formally decided to file a petition to the Japanese Government strongly urging that the abstention principle of the present Japan-Canada-United States North Pacific Fisheries Convention be abolished. In attendance at the meeting were leading members of the Japanese salmon industry, including fishermen's unions and associations.

The Committee planned to adopt concrete policies after first determining the intentions of the United States and Canada at the interim meeting which convened in Hawaii on August 13. At the meeting, the Committee Chairman announced that the present Treaty is unfair and it would be better to negotiate a new treaty. (As reported and translated from the Japanese periodical Suisan Keizai Shimbun, August 10, 1962.)

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SOCIALIST PARTY OPPOSES EXTENSION OF TRIPARTITE NORTH PACIFIC FISHERIES CONVENTION:

Japan's Socialist Party has decided to oppose the extension of the present Tripartite (Canada, Japan, United States) North Pacific Fisheries Convention. It plans to question the Government's policy on this issue at a special Diet session. The Socialist Party is also expected to urge the Japanese Government to terminate its membership in the Tripartite Commission as soon as Japan fulfills her present Treaty obligations, and to establish a basic policy to guide Japan's fishing activities on the high seas so that Japan can negotiate a reasonable fisheries treaty based not on the voluntary abstention principle but on the principle of equality reciprocity, resource conservation, and prevention of disputes. The Socialist Party claims that the existing Fisheries Treaty is: (1) unequal; (2) not based on scientific findings; and (3) adversely affects the development of the Japanese fishery. (As reported and translated from the Japanese periodicals Suisan Keizai Shimbun and Minato Shimbun, August 11, 1962.)

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FISHING FIRMS PLAN TRAWL FISHING IN NORTHWEST ATLANTIC:

Three Japanese fishing firms are reported to be planning trawl fishing for cod in the northwest Atlantic Ocean off the southwest coast of Greenland. The three companies were expected to file applications with the

Fisheries Agency by early August this year to engage in that fishery, and the Agency is said to have unofficially approved one application.

According to present plans, one firm plans to employ its freezer ship Tenyo Maru No. 3 (3,500 gross tons) which it will convert into a stern trawler, and assign to it two portable catcher vessels, each of 20 gross tons. The second company plans to operate one vessel Aoi Maru No. 2 (1,100 gross tons). The third company will operate a 1,500-ton trawler. Upon approval by the Fisheries Agency, the three companies plan to make necessary preparations so that fishing operations can be launched in the spring of 1963. The company whose application reportedly has been officially approved hopes to start operations this year. The three firms hope to export their cod catches to the United States and to Europe.

According to press reports, the Japanese Fisheries Agency is considering the possibility of joining the International Northwest Atlantic Fisheries Commission. (Suisan Tsushin and Suisan Keizai Shimbun, July 24; Nihon Suisan Shimbun, July 25, 1962.)

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FISHERIES AGENCY AUTHORIZES TRAWLING IN NORTHWEST ATLANTIC OCEAN:

A Japanese press report of August 1, 1962, states that the Fisheries Agency has officially authorized a Japanese fishing company to operate a trawler in the northwest Atlantic Ocean. The company was scheduled to dispatch the Aoi Maru No. 2 to the waters off Greenland on August 2. The trawler was to depart from the Japanese port of Nagasaki in southern Japan and was expected to arrive off Greenland in early October. (Suisan Tsushin, August 1, 1962.)

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GUIDANCE AND CONCENTRATION OF FISH SCHOOLS TO BE STUDIED:

The Japanese Fisheries Agency reportedly is planning on a new three-year fishery research program from FY 1963 (April 1963-March 1964) to conduct basic studies on methods of guiding and concentrating fish schools. The primary objective of this research program will be to develop an effective method of concentrating fish schools of relatively low density, such as those fished by means of gill nets, as well as to develop suitable fishing methods and gear. As a means of attracting or guiding fish, lights, guiding nets, air curtains, and articles both attractive and repulsive to fish will be used in the study. This program will be supervised by the Tokai Regional Fisheries Research Laboratory at Tokyo and is scheduled to be conducted in three phases.

Japan (Contd.):

FY 1963: Basic experiments with low-density fish schools will be conducted. Experiments will be conducted with fish held in tanks and in ponds and lakes. As means of concentrating fish, lights will be used to test the reaction of rainbow trout and kokanee (land-locked red salmon). Tests will be conducted to guide fish by such means as artificially-created air curtains and cold-water zones, in addition to nets.

FY 1964 (April 1964-March 1965): Methods of concentrating fish developed in the preceding year will be put to practical tests in lakes and in coastal waters to determine their feasibility. In these tests, small set nets, surrounding nets, and midwater trawls will be used. Studies will also be made regarding possibilities of separating catches.

FY 1965 (April 1965-March 1966): Field tests in coastal waters will be continued to determine the effectiveness of the methods developed. If results are satisfactory, the new methods will be introduced subsequently to commercial fishermen.

Reportedly, the above studies are being prompted by the problem faced by the Japanese salmon fishery, where, despite improvements in fishing efficiency brought about through refinements in fishing techniques and gear, the problem of gilled salmon falling off from the nets and of salmon being injured by gill nets have not yet been solved. Gear-caused injury and mortality have been the subject of discussion at every annual fisheries negotiation held between Japan and the Soviet Union, and Japan plans to conduct the above studies in an attempt to solve this problem. (*Suisan Keizai Shimbun*, July 11, 1962.)

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NEW MARINE RESEARCH INSTITUTE ESTABLISHED:

A new Institute, called the Ocean Research Institute, University of Tokyo (ORITU), was established in Tokyo in April 1962.

The Institute is the first of its kind established in Japan for the scientific study of basic problems of the oceans, their resources, and fisheries. It is expected that the Institute will have 15 divisions, with a full staff of about 200 professionally-trained persons within a few years. They will cover the fields of physical oceanography, submarine geophysics, marine meteorology, submarine geology, chemistry and biochemistry of the oceans, marine biology, and various phases of scientific fisheries. The Institute plans to have two research vessels, one of 250 tons and another of 3,000 tons, to be used primarily for exploring the deep sea and ocean floor.

The Institute was established at the University of Tokyo for two main reasons: 1. It was the general consensus of Japanese marine scientists that there should be a Japanese institution exclusively devoted to the study of basic marine problems. 2. They believed it would be more appropriate if the Institute were set up as an adjunct of the University of Tokyo. The Institute will be used not only by the scientists from the University of Tokyo, but also by those from other

universities and organizations of Japan. It is also expected that scientists from other countries will be able to do research at the Institute.

The office of the new Institute was temporarily located on the campus of the University of Tokyo. Plans are being made for a building in a permanent location not far from the main campus of the University.



Republic of Korea

FIRM TO PURCHASE TUNA VESSELS:

The U. S. Foreign Investment Promotion Committee, on June 28, 1962, approved an application for foreign investment by a South Korean firm for the procurement of six 135-ton tuna vessels. It was reported that an investment of \$720,000 is to be financed by a loan from the New York subsidiary of a Japanese firm. The six tuna vessels are to join the vessels being operated by the Korean firm in Samoan waters.

Tuna caught by the Korean firm's fishing fleet is supplied, under contract, to a United States packer's cannery plant in American Samoa. (United States Consulate, Seoul, July 13, 1962.)

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SIX TUNA VESSELS TO BE BUILT IN JAPAN:

A Korean firm, which presently operates a number of tuna vessels out of American Samoa, is reported to be planning on constructing six tuna vessels in Japan with the aid of United States capital. Reportedly, the order for the vessels has already been placed with a Japanese shipbuilder.

Exports of Japanese tuna vessels are prohibited by the Japanese Government. To circumvent this restriction, the six vessels are to be constructed not as tuna fishing vessels but as carriers and, supposedly, are for export to Switzerland, from which the Korean firm would purchase the vessels.

Without a doubt, all the vessels will be based at American Samoa. This means that they will enter into direct competition with Japanese tuna vessels, but, despite this, the Japanese Government licensed the construction of these vessels. Consequently, strong objections are being voiced within the Japa-

Republic of Korea (Contd.):

nese tuna industry. (Suisan Tsushin, July 26, 1962.)

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FISHERY COOPERATIVES LAW ENACTED:

A new fisheries cooperative law was enacted by South Korea early in 1962, to encourage the economic development of the fishing industry.

Almost 32 percent of the marketing cooperatives had business volumes of \$1 million or more. About 13 percent of the farm supply cooperatives had business volumes of \$1 million or more. No cooperative whose business was primarily performing services related to marketing or farm supply purchasing reported a business volume of \$1 million or more.

Almost 22 percent of these cooperatives did a business ranging between \$1 and \$10 million in 1959-60 compared with about 17 percent in this group in 1955-56. About 2.4 percent reported a business volume upwards of \$10 million in 1959-60 compared with 1.7 percent doing a comparable volume of business in 1955-56. On a numerical basis, 2,242 cooperatives had volumes of \$1 million or better in 1959-60 compared with 1,863 cooperatives in 1955-56. The new law provides for the formation of fishing cooperatives, fishery manufacturers cooperatives, and a central association of fishery cooperatives. Membership in the cooperatives is on a voluntary basis and no token stock investment is required. The selection of key officials and all operations are subject to close Government control. A majority of the financial support will come from the Government.

The Military Government of the South Korean Republic is committed to improving the welfare of the fishermen through co-operative action, and is aware of the great amount of educational work to be done in that area of cooperation among the Korean fishermen.

Note: See Commercial Fisheries Review, May 1962 p. 64.



Malagasy Republic

JAPANESE AND CHINESE AID IN DEVELOPING TUNA FISHERY:

A Japanese fishing company will train Malagasy fishermen in modern tuna fishing

techniques under the terms of a new cooperative agreement with the Government of the Malagasy Republic. The firm will also help set up tuna canning facilities at Majunga.



Fig. 1 - Fishermen on the southwest coast of the island fish between the coast and the large coral reef that runs parallel to it. Canoes in a semicircle chase fish towards nets off the beach. The fish hemmed in by the nets are speared.

The Government has also undertaken an experimental cooperative fishing venture with a Taiwan company. With the aid of the Chinese company, tuna canning has been started at Diego-Suarez for domestic consumption.



Fig. 2 - Mako shark (*Isurus oxyrinchus*) caught by research vessel Maru Atha.

Exploratory fishing has shown that the Mozambique Channel is suitable for Japanese and Chinese long-line tuna fishing techniques.

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Malagasy Republic (Contd.):

FISHERIES TRENDS:

Despite over 3,000 miles of coastline, salt-water fishing in the past has been limited to the efforts of a small group of tribesmen on the southwest coast. The tribesmen use small canoes equipped with sails, but usually hand-



Fig. 1 - Maran Atha, research vessel of Centre d' Oceanographie et des Peches. This vessel has explored for tuna off the north-west coast of Malagasy using Japanese long-line gear.

paddled. Fishing is done fairly close to shore. The catch is consumed in the fishing villages or sold to nearby villages. The tribesmen have no storage or transport facilities and their catch does not appear in inland markets.

Various shellfish are caught along the coast. They are mostly consumed locally, except for small amounts flown to Tananarive. Small canning and freezing operations planned or undertaken in the past have been unsuccessful. The Government has recently been engaged in exploratory shrimp trawling, lobster fishing, and tuna long-lining.



Fig. 2 - Workers at a Government pilot station on Lake Alaotra. The station was set up to smoke lake fish and produce fish meal, and fillet fish for smoking.

In contrast to salt-water fishing, fresh-water subsistence fishing is widely practiced in Malagasy. Fish are increasingly being recognized as a means of reducing protein deficiencies in the Malagasy diet. The Gov-



Fig. 3 - An entire family casts fishing lines into Lake Alaotra, Malagasy Republic.

ment carries on a program of fish farming and stocks the rivers and ponds with carp, black bass, tilapia, and many other varieties. Fishing techniques are very simple and the fresh-water catch is estimated at 12,000 tons annually. (United States Embassy, Tananarive, report of April 2, 1962.)

Note: See Commercial Fisheries Review, Feb. 1962 p. 85 and p. 93, Jan. 1962 p. 58.



Malaya

JAPANESE-MALAYAN TUNA BASE CONCENTRATING ON FROZEN TUNA EXPORTS:

The Japanese Overseas Fisheries Company (which manages the joint Japanese-Malayan tuna base, including a cannery) at Penang, Malaya, was granted by the Japanese Fisheries Agency, in December 1961, a quota of 36,000 cases of canned tuna in brine for export to the United States. Subsequently, in April 1962, the Agency designated Penang and Singapore as transshipment ports and allotted a 4,000-ton frozen tuna export quota to those two ports. In addition, the Agency authorized the Company to land, at Penang, 6,000 short tons of fresh tuna for freezing and transshipment to the United States.



Subsequent developments following the allocation of the above export quotas for canned tuna, frozen tuna, and fresh tuna to the Penang base indicate that the Penang base is now concentrating on transshipping clipper-caught Indian Ocean frozen tuna to the United States, suspending almost entirely the production of canned tuna in brine for export. Also, only small amounts of fresh tuna are being landed at Penang as a result of the Company's lack of success in attracting ice-carrying fishing vessels to fish out of Penang.

Apparently, under present operating conditions, the cannery at Penang cannot be operated at a profit, and Japanese tuna indus-

try members believe that the Malayan tuna base may eventually turn to the production of tuna loins for export to the United States. (Suisan Tsushin, July 19, 1962, and other sources.)

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FROZEN TUNA TRANSSHIPMENTS TO U.S. FROM PENANG AND SINGAPORE:

Transshipments of Indian Ocean frozen tuna to the United States from Penang (Malaya) and Singapore (the two ports which were designated as transshipment bases in April of this year and granted a combined export quota of 4,000 short tons) were reported proceeding smoothly as of July 10; transshipments totaled



Japanese fishery research vessel *Shoyo Maru* visited Penang, Malaya, early this year before going on a search for tuna fishing areas in the vicinity of Mauritius.

Indian Ocean Frozen Tuna Transshipments, April-July 10, 1962

Transshipment Port	Albacore	Yellowfin	Total
Penang	1,396.00	2,763.00	1,159
Singapore	114.16	235.84	350
Total	510.16	998.84	1,509

1/Includes 50 tons transferred from direct export (from Japan proper) quota.

2/Includes 20 tons transferred from direct export (from Japan proper) quota.

1,509 short tons. On the other hand, the fresh tuna quota of 6,000 short tons authorized landed at Penang for freezing and transshipment to the United States is not expected to be met. Conjecture is that by the end of the fiscal year (March 1963), fresh tuna landings at the Penang base may only reach somewhere between 1,000-2,000 short tons. The poor landings of fresh tuna are attributed in part to the fact that the Japanese Overseas Fisheries Company, which operates the tuna base at Penang, so far has not been able to attract more ice-carrying tuna vessels to its overseas base. However, by the end of September or by early October of this year, several ice-carrying fishing vessels are expected to un-

Malaya (Contd.):

load their catches at Penang. (Suisan Tsushin, July 11, 1962.)

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**TUNA FISHERMEN URGED TO
BRING CATCHES TO PENANG:**

Ex-vessel tuna prices paid at Penang were increased 10 to 20 percent in May 1962 by the Overseas Fisheries Company. The increase was announced by the Japanese firm which operates the joint Japanese-Malayan tuna-packing plant at Penang. Japanese tuna fishermen were later brought together by the Japanese firm, which explained its reconstruction plans for the Penang Base and asked for the fishermen's cooperation.

The firm requested that iced fish vessels bring their catch to Penang, and emphasized that the new prices were more than 20 percent higher than those at bases on the South Pacific islands. It was pointed out that those vessels could make the trip to the Penang base in about 25 days on the average, including the time required to unload the fish. (Suisan Tsushin, July 2, 1962.)

Note: See Commercial Fisheries Review, July 1962 p. 86.

**New Caledonia****TUNA CATCH QUOTA FOR
JAPANESE-FRENCH FISHING BASE:**

A Japanese fishing firm, who earlier this year filed an application with the Fisheries Agency to establish a joint Japanese-French tuna fishing base in New Caledonia, plans a catch quota of 10,000 tons. The firm plans to use some 30 tuna vessels. As soon as permission is received from the Fisheries Agency, the firm intends to begin fishing. The freezing of tuna at the base is to be a joint operation with the New Caledonia Development Public Corporation. (Suisan Keizai Shimbun, June 29, 1962.)

**Norway****MACKEREL SHARK FISHERY
OFF UNITED STATES WATERS:**

The Norwegian mackerel shark fishery in waters near the coast of America now appears to be entering a new phase.

Among the vessels now fishing, several are chartered by a Danish company and will land part of their catches in St. Pierre, near Newfoundland, and part in a Danish port. The plan includes Norwegian boats as well as two Faroese fishing boats, Bakur and Hoi Vikingur. The Danish firm has agreed to export to Italian buyers 1,000 metric tons of frozen mackerel sharks from the Newfoundland fishing grounds. It is believed that the vessels which have contracted with the Danish firm will receive a price of 2-1/2 kroner a kilogram (16 U.S. cents a pound) for mackerel sharks landed in St. Pierre, and 3 kroner a kg. (19 cents a pound) for fish landed in Denmark.

Norway's Mackerel Shark Fishermen's Sales Association (Habrandfiskernes Salslag) is familiar with this situation and has brought the matter to the attention of the Norwegian Fisheries Department.

The cause for this concern may stem from the course that the market for mackerel sharks from Norway took in 1961, after the large landings of frozen mackerel shark from the waters off America. This concern developed after a Danish vessel last winter began mackerel shark fishing in the "North Atlantic Ocean." The fishing grounds were described that way in the newspapers in an attempt to camouflage the information concerning the fishing area. Actually, fishing extended to the waters east of New York.

According to some reports, there is exceptionally good mackerel shark fishing off the American Coast. When the Norwegian mackerel shark vessels had fished for 14 days, they had obtained full loads.

There has been apprehension that the supplies of mackerel shark in Norway might depress the market and lead to a collapse. It now seems that by contracting their boats to the Danish firm, the Norwegian vessels have avoided the problem of landing in Norway; consequently, the matter is put in an entirely different light. Norway exported about 1,200 tons of mackerel shark each year in 1959-60 with Italy the principal buyer. Exports were far less than that in the years previous to 1959, but averaged about 2,000 tons shortly before and immediately after World War II. The Italian market is sharply limited, and Norway has competition from Japan and France. It is assumed that a quantity of 1,000 tons of frozen mackerel shark from Denmark will also influence the selling conditions for fresh mackerel shark from Norway and the price for Norwegian mackerel shark in general.

The Danish firm has apparently contracted for the landing of a quantity of mackerel shark that exceeds slightly the Norwegian export quantity, except for 1959-60. If the Italian market is provided with such a quantity, it will not need imports from Norway. The Mackerel Shark Fishermen's Sales Association will then become only an historical group.

There is a good possibility that the demand for mackerel shark in the Italian market may be somewhat more than is now believed. The supplies in the years before World War II suggest it. But it is likely that this additional demand in later years was met by Japanese suppliers. (Fiskaren, 39 arg., no. 21, p. 5.)

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**FOREIGN MINISTER PRESENTS
DECLARATION ON MEMBERSHIP IN EEC:**

Norway's declaration in connection with its application for negotiations on full membership in the European Economic Community (EEC) was presented before the EEC Council of Ministers at Brussels on July 3, 1962. It was agreed at the meeting that actual negotiations would start this fall.

"The Norwegian Government," the Foreign Minister stated, "desires to contribute to the

Norway (Contd.):

development of a closer economic and political cooperation in Europe. Such a cooperation could strengthen Western unity and act as a stimulant for world trade, not least in relation to the developing countries. He added that "The Norwegian Government agrees with the objectives and the measures outlined in the Treaty of Rome. It believes that an expanded EEC can create new prerequisites for solving the special problems in each member country."

A major part of the declaration described the peculiar problems that EEC membership would entail for Norwegian farming and fishing. The cost of many agricultural products in Norway is relatively high and the trend is toward the creation of larger and more economic operating units. It was stressed that rationalization of Norwegian agriculture must be carried out over a long period lest it inflict permanent damage to the social structure in rural communities. The Foreign Minister said, "The special conditions of Norwegian agriculture, together with the social interest of maintaining essential farm settlements and farm production, require special solutions that necessitate special measures. The Norwegian Government believes it is feasible to find these solutions, within the framework of the Treaty of Rome."

The Norwegian Foreign Minister said his Government also assumed that Norway, as the largest European exporter of fishery products, would have an opportunity to participate in discussions on formulation of a common fisheries policy for EEC. Moreover, in light of the special conditions that prevail along the Norwegian coast, Norway would request discussions of the Rome Treaty provisions on the rights of establishment and the problems that these might create for Norway's fishing industry.

As Norway sees it, a common fisheries policy should recognize the necessity of regulations to protect fish stocks against overexploitation, facilitate the development of stable markets for high-quality fish at reasonable prices, and assure adequate living conditions for fishermen. (News of Norway, August 16, 1962.)

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ONLY FOUR FLEETS TO PARTICIPATE IN 1962/63 ANTARCTIC WHALING:

Norwegian whaling companies, after an extended period of indecision, announced that they would participate in the 1962/63 Antarctic whaling season.

Four Norwegian expeditions are to take part in the 1962/63 whaling season as against seven expeditions using 71 catcher boats the previous season. Two whaling factory ships have been withdrawn permanently, in accordance with an agreement between the Norwegian whaling companies. The four factory vessels (Thorshavet, Thorshovdi, Kosmos IV, and the Sir James Clark Ross) are all registered at Sandefjord, the main port in the Province of Vestfold.

The lower number of whaling expeditions for 1962/63, together with an even bigger reduction in the number of catcher boats, will probably mean that the Norwegian quota of 4,200 blue-whale units cannot be fulfilled. The total catch by seven expeditions during the 1961/62 season amounted to less than 3,700 blue-whale units, as against the original quota of 5,100 units.

Of the 4,557 Norwegian crew members who took part in the 1961/62 Antarctic whaling, 2,850 came from Vestfold. In the coming season, the number from Vestfold will be cut down to about 2,200. The cutback, it was believed, would be felt in the traditional whaling districts which have derived a considerable part of their income from the Antarctic whaling operations. This is true in spite of the trend in recent years that nearly half of the whaling crews give up sailing at the end of the season and take jobs in the Norwegian merchant fleet, or in factories.

During the 1961/62 season, the seven expeditions paid nearly 50 million kroner (US\$7 million) for wages, about 21 million kroner (\$2.9 million) for repairs, and some 30 million kroner (\$4.2 million) for outfitting.

The decision to take part in Antarctic whaling next season was reached despite the large quantity of unsold whale oil (estimated to be about 29,000 tons) and the poor prospects for future profitable operations. Norway's whaling companies have operated with little or no profit during the past few years because of the weak market for whale oil. The market price for whale oil during the

Norway (Contd.):

summer of 1962 was £40 (about US\$112) a long ton (about 5.0 U. S. cents a pound), with unsold stocks in Norway then at about 30,000 tons. The only encouraging sign in the whaling picture for Norway was reported to be in the newly-developed market for frozen whale meat in Japan. In the 1961/62 Antarctic season, the whale meat production of one of the Norwegian expeditions surpassed the oil production in value.

The Norwegian Government served notice on December 29, 1961, of its conditional withdrawal from the International Whaling Convention, because it was not certain whether the conditions for Norway's continued adherence to the Convention could be fulfilled. The withdrawal was to be cancelled as soon as an agreement on distribution of the international whaling quota was signed by the five whaling nations prior to July 1, 1962. (United States Embassy, Oslo, August 6, 1962, and News of Norway, August 16, 1962.)

Note: See Commercial Fisheries Review, Aug. 1962 p. 85, Feb. 1962 p. 88.



Pakistan

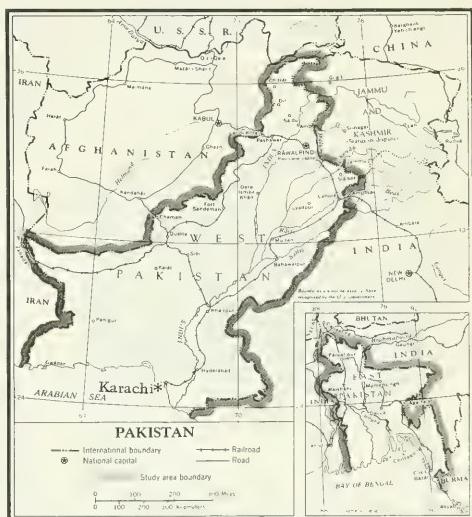
UNITED STATES FIRMS INVITED TO AID GOVERNMENT IN DEVELOPING FISHERIES:

Pakistan's Ministry of Food and Agriculture (Agriculture Division) invites interested firms in the United States to submit proposals for joint United States-



Baskets of small fish ("kaokra") brought ashore at Ibrahim Hydari, small fishing village 11 miles from Karachi.

Pakistani commercial fishing ventures. It is believed that waters off the coast of Pakistan are rich in fish and shellfish. The fishing industry along the coast of Pakistan is not well developed, although modern facilities for handling fish have been established at Karachi harbor.



It is understood that Pakistan needs the services of technicians who can offer the Government a detailed plan for the exploration of their fish wealth. Technicians are also needed who can show them how to operate an exploratory fishing vessel and its gear.

Pakistan wants to obtain an exploratory fishing vessel of about 70 gross tons or more. The vessel should be equipped for shrimp trawling and should also be equipped to purse seine for sardines, mackerel, and threadfin. Pakistan may want to purchase additional fishing vessels and gear.

Initially fishing would be confined to waters off West Pakistan and would be aimed at locating shrimp breeding areas. But the Government is also interested in exploratory fishing in the Arabian Sea and in the Bay of Bengal adjoining East Pakistan. (United States Embassy, Karachi, June 28, 1962.)



Panama

VESSEL CHARTERED FOR SPINY LOBSTER EXPLORATIONS:

The U. S. Bureau of Commercial Fisheries contracted with the U. S. Agency for International Development (AID) on June 20, 1962, to conduct a spiny lobster survey in the waters along the east and west coasts of Panama. The purpose of the survey is to determine the potential of the spiny lobster fishery, and to assist the Panamanians in the development of the resource if the potential shows promise.



Fig. 1 - Full starboard view of the M/V Pelican at the dock in Jacksonville prior to the vessel's departure for Panama.

The vessel Pelican was chartered from a private firm for that purpose. The Bureau is to provide the Master for the vessel and some of the equipment. All other personnel, material, supplies, and other equipment is to be furnished by AID.



Fig. 2 - Partial view of the wheelhouse showing instrumentation, including radar.

The survey will take 14 months to complete, and the responsibility for performance under the contract was assigned to the



Fig. 3 - Hydraulic lobster pot hauling block.

Bureau of Commercial Fisheries Region 2, St. Petersburg Beach, Fla. The Bureau's Exploratory Fishing and Gear Research base at Pascagoula will exercise general supervisory authority over the survey work.



Peru

FISHERIES TRENDS, SECOND QUARTER 1962:

The Peruvian fishing industry continued to expand during the second quarter of 1962. According to industry data total exports of all fishery products amounted to 559,771 metric tons during the first half of 1962, up 27.7 percent from fishery products exports of 436,790 tons during the same period of 1961. Data are not available on the quantity of fish meal produced and exported during January-June 1962. But fish meal exports on the average account for about 85 percent of Peru's total exports of fishery products. (Editor's note: According to reports submitted to the International Association of Fish Meal Manufacturers, Peruvian fish meal production January-May 1962 amounted to 460,623 metric tons.)

The value of fish meal exports during the first quarter of 1962 was 845 million soles (US\$31.5 million), over three times greater than the value of fish meal exports during the same period of 1961.

Value (f.o.b.) of Peru's Exports of Fish Meal, First Quarter 1960-62

January-March					
1962		1961		1960	
Million Soles	US\$ 1,000	Million Soles	US\$ 1,000	Million Soles	US\$ 1,000
845.0	31,506	260.1	9,705	360.2	13,004

Note: Values converted at rate of US\$1 equal 26.82 soles in the first quarter of 1962; 26.80 soles in the same period of 1961; and 27.70 soles in the first quarter of 1960.

During the first quarter of 1962 exports of fish meal led all other Peruvian commodity exports in value, and fish oil exports ranked ninth. Heavy stocks of fish meal carried over from 1961 partly accounted for the unusually large shipments in the first quarter of 1962. Fish meal exports

Peru (Contd.):

during the second quarter were not as large as in the first quarter. But industry representatives estimate that fish meal exports for the full year 1962 will be over a million tons, possibly 1.2 million tons. In 1961, fish meal exports amounted to 760,619 tons according to industry data (Government statistics show 1961 fish meal exports as 708,366 tons).

Peruvian fish meal producers enjoyed a strong world market demand for their products in the first half of 1962. During the first quarter of 1962, fish meal export prices averaged about US\$92 per metric ton, 31.4 percent above the average export price of \$70 per ton in 1961. European demand increased due to poor crops of animal feedstuffs in many continental areas. Reduced competition from other fish meal producing countries which continue to experience low production also helped create a favorable market for Peruvian fish meal. The present good returns to Peruvian fish meal producers have spurred substantial additional interest in investment in fish meal plants. It is understood that 72 applications for licenses to establish new fish meal plants along the Peruvian coast were submitted during the first half of 1962 and 38 have been granted. But construction of new plants in the Lima-Callao area has been prohibited.

A constantly increasing number of fishing vessels of larger size and capacity, permitting access to fishing grounds farther from the coast, is expected to supply enough anchoveta for the potential increase in production. There seems to be no concern that there will be overfishing of anchoveta in Peruvian waters. Also, there appears to be little concern that there will continue to be a profitable market for the increased production of fish meal expected in the future.

The Consorcio Pesquera del Peru, S. A. (Fisheries Consortium of Peru) is the marketing agency for a large percentage of Peru's fish meal production. It has been reported that the Consortium is working to expand its membership through broadening the advantages its marketing organization can offer. The Government may even require producers, especially those entering the industry, to become members. In the second quarter of 1962, producers in the Consortium accounted for 82 percent of total fish meal production. (United States Embassy, Lima, July 26, 1962.)

**South Africa Republic****TUNA FISHING DEVELOPMENT OPPORTUNITIES:**

There is a constantly growing interest within and without the South African fishing industry in the possibilities of developing an important tuna fishing industry in South Africa. This industry is thought of as an export industry; emphasis is almost entirely on catching and freezing tuna for export to Italy, Yugoslavia, and the United States. The market potentials must, therefore, be measured in terms of the world market for tuna.

In South Africa there are groups interested in exploiting the tuna possibilities. Aside from rod-and-line fishing from pleasure boats, tuna fishing to date has been done in the pilchard off-season with wooden pilchard boats and Japanese long-line gear. The Fisheries Development Corporation, a Government-sponsored body, has equipped one pilchard boat with a tuna purse seine and power block, but tests have only just started and cannot be evaluated yet.

According to investigations of the South Africa Department of Fisheries and the findings of two other firms or groups of companies, tuna is abundant in South African waters. There were about 400 metric tons of tuna caught in

1961. The estimate for 1962, based on present catches, is 3,000 tons. Catch of one boat in early August was 4 tons per day. Catch of another boat in one morning's set was 3.5 tons. The boats are 50 to 60 feet, and fishing is with Japanese-type long lines.

The tuna presently caught by long lines brings the following prices at the dock: Price to boat owners who borrow equipment from factory and receive ice and bait is \$57.14 a ton. Price to boat owners who have their own equipment, ice, and bait is \$85.50 a ton. The boat owner pays crew \$25.71 a ton. The fish is weighed after head, fins, and entrails are removed. In 1961 about 400 tons of tuna were caught.

A South African cannery and fishing company is interested in obtaining financial and technical assistance from United States tuna industry interests for establishing a tuna fishing enterprise in South Africa. Registered in 1953 as a proprietary company with an authorized capital of R200,000 (\$280,000) of which R129,100 (\$180,740) have been paid in, the firm operates a fish canning factory at St. Helena Bay, about 80 miles north of Cape Town. The cannery employs 100 workers during the season, November-July. The firm owns two fishing vessels (67-foot wood pilchard boats); is engaged in the catching and canning of pilchards, jack mackerel and true mackerel; production of fish meal and oil; produces a certain amount of dried shark and shark fins; and handles spiny lobster for the local market. Since there is very little room for expansion in the present fishing activities of the firm because they are pegged at their present limits, the firm seeks to enter other types of fishing, such as tuna.

The firm's Managing Director points out that since the long-line method is not the most economical one for tuna, it would be desirable to use purse seines. But since that method needs bigger boats, expensive nets, and a good bit of know-how, the firm envisages to form a subsidiary company for tuna fishing with participation of a United States firm who could bring in some, perhaps 50 percent, of the capital, as well as the necessary experience in purse seining. The type of return envisaged is a share in the equity of the subsidiary company to be formed, up to 50 percent. Investor would be at liberty to share in the management in accordance with his financial interest.

The type of purse seiner used in the United States west coast tuna fishery could be built cheaply in South Africa, but power blocks and nets would have to be imported. There is no import restriction on necessary equipment for the fishing industry and so there is no reason to think that there would be any obstacles in the way of equipping such a vessel. Harbor facilities, including drydock and marine railways, are adequate and there are plenty of highly-skilled fishermen who would be available to man the vessel.

* * * * *

PILCHARD-MAASBANKER FISHERY, JANUARY-MARCH 1962:

The Republic of South Africa cape west coast pelagic shoal fishery for the first three months of 1962 totaled: pilchards 283,613 short tons, maasbunker 4,451 tons, and mackerel 9,207 tons. The total catch was 297,271 tons.

The catch in March 1962 was: pilchards 94,775 tons, maasbunker 3,175 tons, and mackerel 3,020 tons. The total March catch was 100,970 tons. In March 1961 the catch was: pilchards 64,698, maasbunker 4,145 tons, and mackerel 3,663 tons; a grand total of 72,506 tons. In 1960 the total catch in March was 84,327 tons.

South Africa Republic (Contd.):

The March catch this year yielded: fish meal 24,001 short tons, fish body oil 1,793,903 Imperial gallons, canned pilchards 2,244,576 pounds, canned maasbanker 1,681,152 pounds, and canned mackerel 1,333,776 pounds. (The South African Shipping News and Fishing Industry Review, May 1962.)



South-West Africa

FISHERY TRENDS FOR 1961:

Although landings increased, the value of fishery products manufactured in South-West Africa declined in 1961. The record catch of 378,032 short tons of pilchard and maasbanker was 21.9 percent above the amount landed in 1960. Spiny lobster landings in 1961 of 6,361 short tons increased 48.7 percent over 1960. But the total value of manufactured fishery products, estimated at 22,753,000 S.A. rands (US\$31,854,000), was down 9.0 percent from 1960. The value declined because the pack of canned pilchards in 1961 was much smaller than the pack in 1960. The decline in value was partly offset by an increase in the value of the production of frozen spiny lobster tails and fish meal.

In addition to pilchards and spiny lobsters, a total of 1,912 short tons of whitefish, snoek, and other finfish were landed in 1961.

South-West Africa's Production of Sardine (Pilchard) and Spiny Lobster Products, 1960-1961

Item	Production	
	1961	1960
Pilchard:	...(Short Tons)....	
Canned	76,975	114,034
Meal	77,735	55,122
Oil	19,710	16,694
Spiny Lobster:	....(1,000 Lbs.)....	
Canned	306.4	399.4
Frozen tails	3,027.8	1,060.0
Meal	1,330.4	2,029.4

In 1961, production was higher for fish meal (up 41.0 percent) and fish oil (up 18.1 percent). But the pack of canned pilchards was 32.5 percent below the pack in 1960. Heavy stocks of canned pilchards were on hand at the beginning of 1962 even though Walvis Bay canners severely restricted the pack in 1961. Only part of the canned pilchard pack had been sold by July 1962. During 1961 fish meal prices improved, but fish oil prices declined.

The pack of frozen spiny lobster tails in 1961 was almost three times as large as the pack in 1960. Higher prices were received for the larger pack in 1961 because the demand continued to exceed the supply.

The amount of pilchards that may be landed in South-West Africa during 1962 has been raised to 435,000 short tons, an increase of 16 percent over the 1961 quota. (United States Embassy, Capetown, report of June 25, 1962.)

Notes: One South African rand equals about US\$1.40.
Also see Commercial Fisheries Review, May 1962 pp. 68-70; July 1961 p. 87.



Spain

VIGO FISHERIES TRENDS, SECOND QUARTER 1962:

Landings: Fish unloaded at the port of Vigo, Spain, during the second quarter of 1962 was 65.6 percent more in weight and 30.3 percent higher in value than during the first quarter of the year, and 4.9 percent more in quantity and 20.6 percent higher in value when compared with the second quarter of 1961. The average price per kilo for the second quarter of 1962 was 10.38 pesetas (7.8 U.S. cents a pound) compared with 13.24 pesetas (10 cents a pound) for the first quarter of 1962, and 9.04 pesetas (6.8 cents a pound) for the second quarter of 1961.

The much higher landings of octopus and horse mackerel, and the fairly good start of the albacore fishing season were mainly responsible for the increased landings in the second quarter of 1962. The price of albacore started to increase as the season advanced because of the heavy demand from fish canners who were anxious to make up for the poor sardine season. Albacore and sardines are the basic species for the export market of canned fish.

Table 1 - Fish Handled by the Vigo Fish Exchange,
Second Quarter 1962 with Comparisons

Period	Qty.	Value	
		Metric Tons	1,000 Pesetas 1,000 U.S. \$1,000
1962:			
April-June	18,322	190,409	3,173
January-March	11,085	146,117	2,435
1961:			
April-June	17,461	157,931	2,632

Table 2 - Utilization of Fish Landed at Vigo Fish Exchange,
Second Quarter 1962 with Comparisons

Period	Shipped Fresh to Domestic Mkts.	For Canning	Other Processing (Smoking, Drying, Fish Meal, etc.)	Local Con- sumption
			(Metric Tons).....	
1962:				
2nd. Qtr.	9,636	1,830	6,043	813
1st Qtr.	8,624	565	1,160	716
1961:				
2nd. Qtr.	10,948	1,302	4,440	771

Vigo's landings during April 1962 amounted to 5,804 metric tons with an ex-vessel value of 64.7 million pesetas (US\$1.1 million) as compared with 5,831 tons valued at 52.0 million pesetas (\$0.9 million) in April 1961. In May, 5,938 tons were unloaded valued at 54.9 million pesetas (\$0.9 million) as against 6,410 tons and 56.6 million pesetas (\$0.9 million) in May 1961.

The lower landings for May 1962 were caused by a decrease in catches of the following species: small hake 1,028 tons in May 1961 as against 549 tons in May 1962; pomfret 200 tons in May 1961 and 6 tons this May; sardines 378 tons in May 1961 and 207 tons in May this year; and horse mackerel 886 tons in May 1961 and 793 tons this May. Increases in other species, such as octopus, sea bream and cuttlefish, were not large enough to offset decreases in catches of major species.

The lifting on April 15 of the conservation fishing ban on sardines did not help as catches of that species continued

Spain (Contd.):



light through most of the second quarter. The price of sardines at the fish exchange increased from 4.19 pesetas a kilo (3.16 U.S. cents a pound) ex-vessel in April 1961 and 4.99 pesetas (3.76 cents a pound) in May 1961, to 6.87 and 6.96 pesetas (5.19 and 5.27 cents a pound) in April and May 1962. Price increases were also reported for other species.

Canning: The fish canning industry was fairly active during the second quarter of 1962, in spite of lack of commercial species and high costs. Sardine catches were not as abundant as expected, and the prices were high. The albacore fishing season, which started about the middle of June accounted for limited catches only, and the prices also were high. Octopus and shellfish (mainly mussels) made up the bulk of the packing at fish canning plants during the period.

A collective agreement was being discussed for the fish canning industry. Unconfirmed reports indicated that minimum wage increases of about 30 percent will be granted by the agreement. Since this industry is dependent upon labor to a very large extent, it is easy to foresee a substantial increase in production costs, which will inevitably be reflected in the price of the finished product. Prices of Spanish canned fish in the international market are already higher than those for similar products from other countries--Portugal, Morocco, and Japan, in particular--and exporters are apprehensive for their foreign trade prospects.

Also contributing to high production costs is the price of tinplate (which is estimated as a 30-60 percent factor of the total costs). Spanish tinplate costs about 1,720 pesetas (US\$29.00) per 190-pound case. Imported tinplate is obtained at around 1,150 pesetas (US\$19.00) f.o.b.; transportation costs and entrance duties (30-percent customs duties plus 12-percent fiscal tax) bring the price of imported tinplate to the level of domestic tinplate. A reduction of 15 percent in customs duties has been requested by the canning industry. About 60,000 metric tons of tinplate are imported each year. The prospects are for an increase in Spanish tinplate production to about 100,000 tons by 1963, when the needs of the canning industry will be around 140,000 tons. The problem of tinplate prices seems to be a long-term one.

Table 3 - Landings and Average Ex-Vessel Prices of Principal Species at Vigo Fish Exchange

Species	April-June 1962			January-March 1962			April-June 1961		
	Qty.	Average Price		Qty.	Average Price		Qty.	Average Price	
		Metric Tons	Pesetas/Kilo		Metric Tons	Pesetas/Kilo		US\$/Lb.	US\$/Lb.
Octopus	5,763	3.09	2.3	1,711	4.44	3.4	3,249	3.23	2.4
Horse mackerel	2,627	4.34	3.3	1,682	6.00	4.5	2,391	2.71	2.0
Hake, small	2,176	25.58	19.3	2,794	23.07	17.4	2,973	19.84	15.0
Sardines	777	7.21	5.5	105	7.93	6.0	1,411	5.20	3.9
Sea bream	552	11.76	8.9	424	18.95	14.3	237	10.74	8.1
Hake, large	493	46.62	35.2	145	59.16	44.7	238	45.45	34.4
Albacore	453	28.37	21.4	-	-	-	188	23.04	17.4

Albacore Tuna Fishing: The albacore tuna fishing season started during the last week of June. The catches were reported to run higher than during the first days of the 1961 season. Prices at the fish exchange averaged 25-30 pesetas a kilo (18.9-22.7 cents a pound) as compared with an average of 23.04 pesetas a kilo (17.4 cents a pound) in 1961. In the opinion of some fishermen, the fishing for the season started too late, since albacore were found close to Vigo Bay and they will probably have proceeded in their migration beyond the range of local fishing vessels before full advantage could be taken of the season.

La Coruna Fishing Port: Improvements are being planned for the La Coruna fishing port, second in importance in Galicia. The new facilities will include a 3,100-foot pier, fish exchange, post office, telephone and telegraph, banking and other services. The plan is designed to attract fishing vessels from other ports to La Coruna, and to take full advantage of the increased capacity of the fishing fleet under the new "Law for the Renovation of the Spanish Fishing Fleet."

Cod: Some of the fishing vessels that sailed to Newfoundland for the cod fishing season in January had returned. Cod catches were less than satisfactory, but data are not available as the fish were landed at several ports in Galicia.

At least one local fish canner is experimenting with aluminum as a substitute for tinplate with some success, especially for the more delicate products such as shellfish, and other fish in which olive oil is not used. It will, however, be some time before aluminum replaces tinplate in the local canneries as the price is still higher than tinplate, and new machinery will have to be installed. Some Portuguese fish canneries are already using aluminum.

Canned Fish Exports: Exports of canned fish from Vigo dropped considerably during the second quarter of 1962. Although complete figures are not available, it is estimated that exports during the period April 21-May 20, 1962, were about 30 percent of the amount exported during the same period of 1961.

Table 4 - Canned Fish Exported from Vigo, January-May 1962

	Metric Tons	Value	Quantity
			USS\$
1962:			
April 21 - May 20	319	194,652	
February 21 - March 20	586	396,261	
January 21 - February 20	915	607,156	

Spain (Contd.):

Lack of commercial species and high prices were given as the main reason for the continued drop in exports, following the high level maintained through the second half of 1961 and early 1962. (United States Consulate, Vigo, report of July 6 and 16, 1962.)

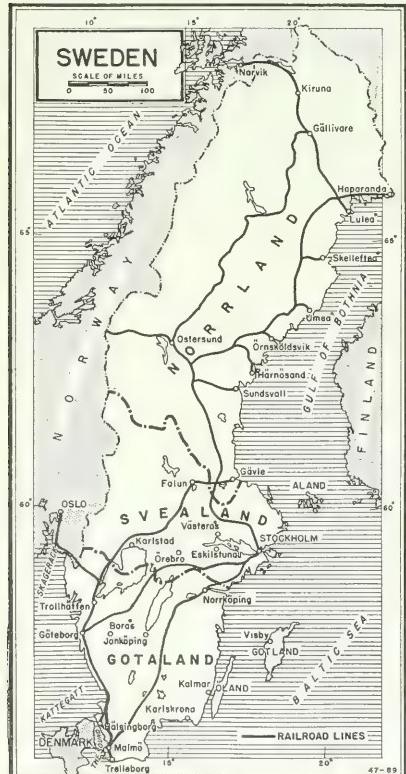
Note: Values converted at rate of 60.00 pesetas equal US\$1.00.



Sweden

FISHING GEAR ATTACHMENT FOR SIMULTANEOUS TROLLING AT DIFFERENT DEPTHS:

A recent development in trolling or line fishing is the Swedish "surfing" paravane manufactured in Goteborg, Sweden. It is claimed that by using 3 or 4 paravanes, fish



can be taken at the same time at different depths.

An illustration of the "surfing" paravane shows a device with two fins sticking out of one side of a round ball. The vertical fin is set on the plane of the horizontal fin. (Editor's note: The paravane appears to have some relation to the familiar trolling "dodger" widely used in salmon trolling. It looks like a "dodger" might look if one end of the "dodger" were inserted in a ball and a vertical fin was then attached to the top side of the "dodger.") Both the vertical and the horizontal fin have sets of holes. Trolling depth can be varied by fastening the line in different holes of the vertical fin of the paravane, by the speed of the boat, by the length of line, and by the size and weight of the bait. Lateral control is provided by the horizontal fin. The surfing paravane signals a bite by surfacing, unless a heavy bait is used.

There are 3 models of the paravane. Model No. 43 is for small fish such as mackerel and trout. Model Nos. 50 and 60 are for large fish such as salmon, kingfish, barracuda, dolphin, and tuna. Using model No. 60, a fisherman can troll to a depth of 90 feet. A greater depth can be reached by using 2 model No. 60's. (*World Fisheries Abstracts*, April-June 1962; *Australia's Fisheries Newsletter*, November 1961.)



Taiwan

FISHERY LANDINGS UP IN 1962:

Taiwan's fishery landings in the first 6 months of 1962 were estimated at 166,400 metric tons, a 10.5-percent increase from the first half of 1961. The growth of Taiwan's fishing fleet is largely responsible for the increased landings during the past few years, as well as the Government's efforts to modernize and expand the fishing industry. Two 550-ton tuna vessels constructed in Japan were delivered to a Taiwan fishery firm early in 1962, and 12 additional tuna vessels of 145-ton capacity, which were being constructed locally with United States aid funds, were due for delivery in September.

The Taiwan Government's success in expanding its fishing industry apparently has exceeded the consumption capacity of the local fishery marketing and processing indus-

Taiwan (Contd.):

tries. During June 1962, a total of 17 private fishing companies petitioned the Taiwan Fisheries Bureau to take action to relieve the offshore fishing industry from overexpansion and overproduction, both of which had contributed to a drop in the market price of fish. During the second quarter of 1962, the average wholesale price of fish dropped by about 30 percent as compared with the corresponding period in 1961. The Taiwan Fisheries Bureau was then somewhat inclined to discount the complaint of the fishing industry but an industry-wide conference was planned for July to review the industry's problems. The possibility of placing a limitation on the number of operating trawlers, finding new fishing grounds, improving the method of fish handling and marketing, reducing operating costs of the fishing industry, and expanding the fish processing industry were items up for discussion at the meeting. The problems were considered domestic primarily, and were not believed to affect Taiwan's deep-sea fishing industry.

The Taiwan Government also held a fish products processing seminar to discuss promotion of export sales of frozen fish. In June, the Kaohsiung Fisheries Association in Taiwan contracted to supply 30 tons of frozen dolphin and 80 tons of frozen tuna to Japan at about US\$300 a ton f.o.b. Taiwan. It was believed that this fish would be re-exported to the United States. There were some reports that Japanese firms were anxious to sign long-term contracts for the supply of frozen tuna to Japan. The Taiwan Fisheries Bureau stated it was more interested in finding direct outlets in the United States, or other markets instead of to Japan. (United States Embassy, Taipei, report of July 31, 1962.)



U.S.S.R.

FISHING FLEET ON
GEORGES BANK, JUNE 1962:

During the third week in June 1962, the Soviet fishing fleet on Georges Bank in the North Atlantic numbered 169 vessels. The fleet consisted of 164 trawlers and gill-netters, a seagoing repair tug, and 4 mother-ships. This is approximately the same number of Soviet vessels as were in the area in



Russian drifter (gill-netter) fishing on the "Northern Edge" of Georges Bank.

late May. Herring was the major species being taken. (Unpublished sources.)

* * * * *

FISHING IN GULF OF ALASKA,
JUNE-JULY 1962:

In a period of six weeks beginning in mid-June 1962, the Soviet fleet in the Gulf of Alaska increased to 107 vessels, consisting of 89 trawlers, 8 freezer ships, and 7 support ves-



Russian king crab factoryship Andrey Zakharov, operating in Bering Sea, July 5, 1961.

sels, such as tugs, tankers, and cargo ships. The fleet, using midwater trawls, was catching mostly Pacific ocean perch and some sablefish. No halibut or other bottom fish were reported taken. The fleet was gradually moving eastward and was last reported late in July in the vicinity of Chirikof Island. (Unpublished sources.)



United Kingdom

BRITISH FISHERIES TRENDS, 1961:

Landings: White fish landings by British and foreign vessels in the calendar year 1961 amounted to 780,022 metric tons, down 3.1 percent from landings in 1960. But the ex-vessel value of those landings in 1961 was slightly above that of the larger catch one year earlier.

United Kingdom (Contd.):

Great Britain's White Fish Landings, 1961-60			
Year	Quantity	Ex-Vessel Value	
		Metric Tons	Million £	Million US$
1961	780,022	61.3	171.6
1960	805,028	60.7	170.0

Note: The term "white fish" excludes pelagic fish and shellfish.

A drop of 5.3 percent in white fish landings by British vessels was partly offset by an increase of 10.3 percent in white fish landings by foreign vessels.

The decline in landings by British vessels in 1961 was mainly due to reduced rates of catch on almost all fishing grounds by near- and middle-water trawlers. Landings by that fleet in 1961 were down 13 percent even though the fleet increased. A total of 70 new vessels came into service and 58 were scrapped that year. At the end of 1961 there were 514 trawlers in the fleet as against 502 at the end of 1960. The fall in the rates of catch by near- and middle-water trawlers was most severe for English and Welsh trawlers, but it created a serious operating problem for all owners.



Fig. 1 - Distant-water trawler getting ready to dock at Grimsby, England.

Landings by the British distant-water fleet in 1961 of 359,500 tons were down slightly from the previous year. Landings by the distant-water fleet were sustained by an increase in fishing by grant-aided trawlers. The rate of catch fell in all of the main distant-water fishing areas except Bear Island. The decline in the rate of catch was partly due to increased fishing by the less powerful grant-aided trawlers. The average value of the distant-water catch in 1961 was 65s. 4d. per hundredweight of 112 pounds (\$8.17 U. S. cents a pound) as compared to the average value in 1960 of 62s. 7d. per hundredweight (7.82 cents a pound). The quantity not sold at or above the minimum price and used for fish meal was just less than 6,000 tons in 1961 as compared with 7,000 tons in 1960. The number of vessels in the distant-water fleet at the end of 1961 was 228, one less than at the end of 1960. Five new Diesel-powered vessel (including a stern trawler designed to freeze part of her catch at sea) came into service in 1961. In 1961, British yards had ten vessels under construction for the distant-water fleet, includ-



Fig. 2 - Wharf buildings and locks leading to inner harbor, Grimsby, England.

ing one stern trawler designed to freeze her entire catch at sea.

The number of Scottish seiners fell by 56 during 1961, but the fleet accounted for 45 percent of Scottish landings. There was a small increase in the number of English seiners, but their catch declined slightly in comparison with the previous year.

The inshore catch (excluding shellfish) in 1961 was down about 1 percent in quantity and 1.5 percent in value from the previous year. Landings in Northern Ireland recovered from the previous year's low level. Shellfish landings again showed an increase in value--from £2,078,739 (\$5,820,469) in 1960 to £2,376,918 (\$6,655,370) in 1961, due mainly to an increase in the catch of lobsters and Norway lobsters in Scotland.

Aid For Fishing Industry: The White Fish Authority for the fiscal year ending March 31, 1962, showed a deficit of £17,578 (US\$49,218) and the accumulated surplus of the Authority's funds was reduced to £187,183 (\$524,112). This was revealed in the annual report of the White Fish Authority which was published in July 1962. The deficit was mainly due to increased outlays for research. The report stated that for the current year the deficit is likely to be £100,000 (\$280,000) due largely to the cost of additional research. For this reason initial steps were taken to raise the general tax from $\frac{1}{2}d.$ per stone (4.16 U. S. cents for 100 pounds) to 1d. per stone (8.33 U. S. cents for 100 pounds).

The net amount outstanding as of March 31, 1962, on loans made by the Authority for new vessels, motors, nets and gear, improvements, and processing plants was over £22.0 million (\$61.6 million). Past due loans became a problem for the first time during 1961. The amount in arrears reached £417,467 (US\$1,168,908) on May 14, 1962, and placed a heavy burden on the Authority's funds. But it was still possible to meet the half-yearly repayment of £1.4 million (\$3.9 million) to the Treasury on April 30.

The Authority applied a policy of restraint in 1961/62 in approving assistance for building new near- and middle-water vessels. Grants and loans were approved for only six trawlers and one large vessel. From the beginning of the program in 1953 through March 31, 1962, the Authority had assisted 356 near- and middle-water vessels. Total assistance to the near- and middle-water fleet had amounted to almost £33.5 million (\$93.8 million); over £9.5 million (\$26.6 million) in grants and almost £24.0 million (\$67.2 million) in loans.

Only 29 coal-burners were left in the fishing fleet at the end of March 1962, as compared with 87 a year earlier. When the coal-burners have all been scrapped and the vessels now being built have come into service, the size of the near- and middle-water fleet will be two-thirds of the total at the end of 1953.

The Authority examined applications for building new inshore vessels in 1961/62 more rigorously than when modernization was less advanced. In the case of seiners emphasis was on replacement. Only 52 grants for inshore vessels were approved in 1961/62 as compared with 73 in the previous year. Approvals for new motors in 1961/62 amounted to 45, about the same as in the previous year. Through March 31, 1962, the Authority had approved 819 grants for new inshore vessels and 507 grants for new motors. Financial assistance had amounted to over £7.5 million (\$21.0 million); about £2.5 million (\$7.0 million) in grants and £5.0 million (\$14.0 million) in loans.

United Kingdom (Contd.):

In accordance with the broad policy set out in the Government's White Paper on the fishing industry, issued in August 1961, the Ministers have informed the Authority of the arrangements which they desire should be adopted in administering grants for new trawlers of 80 feet and over under the scheme to be presented to Parliament under the Sea Fish Industry Bill. The trawler owners organizations and the Authority were consulted on and concurred in the arrangements.

The arrangements provide that new grant-aided trawlers should genuinely displace older vessels (i.e. pre-war distant-water vessels and near- and middle-water trawlers built without grant) roughly on the basis of one new ton for every two old tons. The Authority should satisfy themselves that the old tonnage was scrapped. Some limited relaxations could be made at the Authority's discretion in respect to small companies, genuine newcomers to the industry, and in certain exceptional circumstances. The Ministers considered that a total provision of £2.0 million (\$5.6 million) for grants for trawlers should be adequate for the period up to the end of 1965. Loans--of up to 60 percent of a trawler's cost--should be made only to applicants who satisfied the Authority that they could not borrow on the open market at reasonable rates of interest.

The trend towards greater concentration of ownership of trawlers in England and Wales continued in 1961. Six companies, or groups of companies, now own 60 percent of the fleet. In Scotland also, the number of owners fell. At Aberdeen at the end of 1961, a total of 51 owners controlled 129 vessels, compared with 62 owning 122 vessels a year earlier.

Marketing and Distribution: The Authority's report records the steps taken on the Fleck Committee's recommendation "that a deliberate and concentrated attempt should be made to raise the average quality of fish by improved handling methods." The recommendation was endorsed in the Government's White Paper of August 1961. The terms of a resolution adopted by a conference convened by the Department of Scientific and Industrial Research at Hull in November showed that the need to raise standards was widely recognized in the industry. A series of discussions on the matter are being arranged jointly by the Fisheries Departments and the Authority. The first, which was held in April 1962, was with representatives of the trawler owners, distributors, and quick-freezers. Meetings with other interests concerned have been planned.

In the course of the year, the Authority discussed with representatives of distributors' organizations some proposals on fish boxes put forward originally by the National Federation of Fish Friers. There was general agreement that regulations should be made prohibiting, first, the use of any box for fish if it had previously been used for another commodity and, secondly, the use of returnable boxes for quantities of more than two stones (28 pounds) of fish. The matter, including the question of enforcement, is now being examined in detail.

The assembly of the equipment for the pilot project for mechanizing the unloading and handling of fish at Grimsby was completed in 1961. It was tried in sections at experimental landings. Progress was delayed for several weeks through the strike in the spring. The results are promising, but certain problems and modifications require further study. While the equipment on trial is providing useful experience, it is



Fig. 3 - At Grimsby, after unloading from the trawler in wicker baskets, fish is transferred to aluminum trays for display to buyers. Auction begins at 7:30 a.m.

cumbersome and difficult to maneuver and is not the ultimate answer. But the traditional method of unloading is clearly wasteful and gives no ground for complacency.

The committee for Scotland and Northern Ireland has continued consultations with the advisory panel on the Highlands and Islands on the development of the shelffish industry, particularly crab fishing.

The Authority's publicity appropriation for 1961/62 remained at the previous year's figure of £75,000 (\$210,000). While the broad divisions of expenditure were much the same--advertising in evening newspapers throughout the country, the merchandising service among fish-mongers and fish friers, and educational work--the general theme of the campaign was revised to take account of the findings of the consumer survey conducted in 1960.

According to returns submitted to the Authority, British production of frozen processed fishery products rose in 1961 by 7.1 percent to 56,157 tons, a smaller advance than in the previous year; about 30,000 tons were in bulk or institutional packs and 26,000 tons were in consumer packs. This production represented a usage of 16.3 percent of total white fish landings. Home market sales rose by 8.8 percent, again a smaller increase than in 1960.

The pilchard catch of 2,669 tons showed a further decline in 1961 of nearly 10 percent. Domestic production of canned pilchards fell by over 15 percent and imports from South and South-West Africa dropped by about 8½ percent.

British production of white fish meal fell slightly in 1961 to 71,100 tons, due to a further drop in supplies of raw materials. But imports showed an increase of 38 percent, mainly from Norway, Denmark, South Africa, Peru, and Iceland. Prices were on the average slightly lower.

Research: The Advisory Group on Experimental Fisheries Work, which was set up by the Fishery Ministers last year to consider what grant-aided experimental work should be done to help the fishing industry to adapt itself to the conditions it would have to face over the coming years, submitted their first report to the Ministers in the fall of 1961. The Authority has started working on the following recommendations of the Advisory Group.

1. Design of new vessels: It was recommended that the best method of assistance was for grants to be given

United Kingdom (Contd.):

en in suitable cases for building experimental vessels on condition that full information was made available for the industry. A grant for a Diesel-electric trawler designed to freeze her whole catch at sea has been made, and the Authority is keeping the need for other prototype freezer vessels under review.

2. Conversion of existing conventional trawlers: The Authority is commissioning a design study, as recommended by the Group, of the reengining of a distant-water steam trawler, preferably with Diesel-electric machinery, and the installation of a freezing plant. Further studies of conversion to part-freezing of distant-water and middle-water motor trawlers will be considered.

3. Development of trawler-freezing plants: The Authority has approached a number of firms about the possibility of developing a compact and lighter compressor with other features advantageous to refrigerating work in trawlers.

Progress on research into trawling gear was made during the year. Modifications and improvements of the Granton trawl as used by distant-water vessels have been tested by the Fisheries Departments' research vessels *Ernest Holt* and *Explorer*, and other trials are planned. Complementary studies on fish behavior have been carried out in the Marine Laboratories at Aberdeen and Lowestoft, and there have been

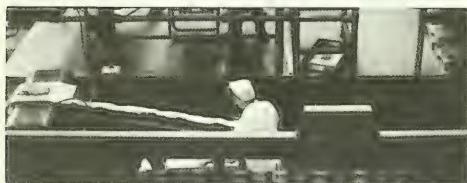


Fig. 4 - Girls candling ocean perch fillets at a Grimsby frozen fish plant.

meetings between the Government scientists concerned with this work and the team working on the gear design.

The survey work by the near-water trawler Made-line continued during the year, though it was severely restricted during the winter months by exceptionally rough weather. Among the different kinds of gear being tried is the latest type of French purse-seine net.

The Authority has asked the Department of Scientific and Industrial Research to inquire into the feasibility of icing and freezing pilchards for subsequent processing as well as the suitability for processing of pilchards caught during certain months of the year.

The Department of Agriculture and Fisheries for Scotland has given permission to a commercial processing concern to undertake exploratory trawling for shrimp in the upper reaches of the Firth of Forth and in the region of Largo Bay. Samples from the fishing are being examined by the Department's marine laboratory at Torry.

Approval was given in August 1961 to a request from the Aberdeen Fishing Vessel Owners' Association for financial assistance towards the cost of trials

with French gear by two Aberdeen trawlers. The trials established, briefly, that this gear was more effective in catching round fish than flat fish and produced higher catches of superior-quality haddock than the Aberdeen gear when fished during daylight. However, the apparent potential of the gear needs further confirmation. Approval has been given for an extension of the trials with the object of securing improvements and obtaining information on the gear's performance in deeper water than normally fished by Scottish trawlers.

The Authority's expenditure of £29,506 (\$82,617) on maintenance grants to fishermen and new entrants attending training was somewhat lower than the previous year's total of £31,184 (\$87,315) due to a decline in the number of trainees. On the other hand, Fleetwood began courses for new entrants which attracted a satisfactory enrollment. At Aberdeen, progress was made in the comprehensive course for Diesel engineers and in the prevacational courses.

The number of trainees receiving grants was 745 (460 on upgrading courses, 43 on Diesel engineers' courses, and 242 on new entrant courses).

Ten training courses were organized by the Authority for retail distributors, in cooperation with local trade associations and education authorities. Courses for fishmongers were arranged at Leeds, Manchester, Bristol, Birmingham, Dagenham, and Woolwich. Courses for fish friers were held at Leeds, Chester, Bristol, and Southampton. With the exception of the two courses in the London area, the numbers enrolling were good. More courses are being planned for the coming autumn and winter. (*Fish Trades Gazette*, July 7, 1962.)

Note: See *Commercial Fisheries Review*, February 1962 p. 96.

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BRITISH FISHERMEN NEED NEW FISHING GROUNDS:

Danish, Faroese, Norwegian, and Icelandic extensions of their national fishing limits or boundaries threaten to drive Britain's high-seas trawlers to such distant waters as the Antarctic or tropical areas of Southwest Africa, according to a news item in the London *Financial Times* of July 12, 1962.

In the future, British fishermen may have to cruise south of the Equator to sustain their present catch level. The trend towards extending national fishing limits to 12 miles could, within 10 years, deprive British trawlers of almost 9,000 square miles of fishing grounds now fished by them. The loss of such traditional fishing grounds may reduce the present British trawler catch by about 30 percent.

According to the London newspaper, the most promising undeveloped trawling grounds are located in waters off Southwest Africa and the Antarctic. Russian trawlers are now conducting exploratory fishing off Southwest Africa. So far British exploratory trawling

United Kingdom (Contd.):

has been limited to the Farm area west of Ireland, the Dohrn Bank off Greenland, and the Grand Banks off Newfoundland. (*Berlingske Tidende*, Copenhagen, July 13, 1962, as translated by the Fisheries Attaché, United States Embassy, Copenhagen.)

* * * * *

BRITISH SUGGEST USING HELICOPTER FOR OCEAN TRAWLING:

Four aircraft designers in Yorkshire, England, have drawn designs for adapting a helicopter to ocean trawling. The designs envision a craft with a dead weight of about 400 tons that could fly 9 feet above the water. It would travel at a speed of up to 100 miles per hour on the way to and from fishing grounds, and have a range of 3,500 miles. It would cost an estimated £1 million (US\$2.8 million) to build. The designers emphasize the advantages of fishing from the air. (The South African Shipping News and Fishing Industry Review, May 1962.)

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FISHERY LOANS INTEREST RATES REVISED:

The British White Fish Authority announced that, as a result of a change in the rates of interest charged to them by the Treasury, their own rates of interest on loans made as from June 16 will be as follows:

Fishing vessels of not more than 140 feet, new engines, nets and gear: on loans for not more than five years, $5\frac{1}{2}$ percent, decrease $\frac{1}{8}$ percent; on loans for more than five years, but not more than 10 years, $5\frac{7}{8}$ percent, decrease $\frac{1}{8}$ percent; on loans for more than 10 years, but not more than 15 years, $6\frac{3}{4}$ percent, decrease $\frac{1}{8}$ percent; on loans for more than 15 years, but not more than 20 years, $6\frac{7}{8}$ percent, no change.

Processing plants: on loans for not more than 15 years, $7\frac{1}{2}$ percent, no change; on loans for more than 15 years, but not more than 20 years, $7\frac{1}{2}$ percent, no change.

The rates on loans made before June 16 are unchanged.

The White Fish Authority announced during the week ending July 21 the following ad-

ditional changes in rates of interest on loans made as from July 14:

Fishing vessels of not more than 140 feet, new engines, nets and gear: on loans for more than 10 years, but not more than 15 years, $6\frac{3}{8}$ percent, decrease $\frac{3}{8}$ percent; on loans for more than 15 years, but not more than 20 years, $6\frac{5}{8}$ percent, decrease $\frac{1}{4}$ percent.

All other rates were unchanged. (Fish Trades Gazette, June 23 and July 21, 1962.)

Note: See Commercial Fisheries Review, June 1962 p. 64.

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NEW SUBSIDY RATES:

Five plans introducing new rates for subsidies and grants for vessels in the white fish and herring industries were laid before Parliament on July 4, 1962, by the British Minister of Agriculture and Fisheries and the Secretary of State for Scotland. The plans were developed under the Sea Fish Industry Act of 1962 which received the Royal assent on July 3, 1962.

White Fish Subsidy (United Kingdom) Scheme, 1962: Provides for both basic and special rates for vessels of 80 feet or more in length. Also provides for changes in the rates for vessels under 80 feet. The new rates, except where otherwise stated, apply for the 12 months ending July 31, 1963. Distant-water vessels and near-middle water vessels will receive subsidy payments for each day at sea. Inshore vessel subsidies will be based on landings.

The rates for distant- and near-middle water vessels are as follows:

Type of Vessel	Payment Per Day at Sea £	US\$
<u>Basic rates for vessels 80 feet or more in length, other than coal-burners:</u>		
Vessels between 80 and 110 feet	9.0	25.20
Vessels between 110 and 140 feet	13.0	36.40
Vessels 140 feet and over	15.0	42.00
<u>Special rates for vessels 80 feet or more in length:</u>		
Coal-burners:		
Vessels between 80 and 140 feet	6.5	18.20
Vessels 140 feet and over	7.5	21.00
Oil-burners built before Aug. 1, 1952:		
Vessels between 80 and 120 feet	2.0	5.60
Vessels between 120 and 140 feet:		
(a) which spent at least 30 percent of their days at sea in 1960 or 1961 fishing grounds in the vicinity of the Faroes:		
Between Aug. 1, 1962 and Dec. 31, 1962	5.0	14.00

(Continued on next page)

United Kingdom (Contd.):

Type of Vessel (Contd.)	Payment Per Day at Sea	
	£	US\$
Between Jan. 1, 1963 and July 31, 1963	2.0	5.60
(b) Other vessels	2.0	5.60
Oil-burners built after July 31, 1952, and motor vessels:		
Vessels between 80 and 90 feet ordinarily fishing from Aberdeen, Lowestoft, or Fleetwood	1.0	2.80
Vessels between 90 and 100 feet ordinarily fishing from Aberdeen	2.0	5.60
Vessels between 100 and 110 feet ordinarily fishing from Aberdeen, Granton, North Shields, Hartlepool, Milford Haven, or Fleetwood	3.0	8.40
Vessels between 110 and 120 feet ordinarily fishing from Aberdeen, Granton, North Shields, Grimsby, or Lowestoft:		
(a) which spent at least 30 percent of their days at sea in 1960 or 1961 fishing grounds in the vicinity of the Faroes		
Between Aug. 1, 1962 and Dec. 31, 1962	4.0	11.20
Between Jan. 1, 1963 and July 31, 1963	2.0	5.60
(b) Other vessels	2.0	5.60
Vessels between 120 and 130 feet ordinarily fishing from Aberdeen, North Shields, Grimsby or Lowestoft		
Between Aug. 1, 1962 and Dec. 31, 1962	3.0	8.40
Vessels between 130 and 140 feet ordinarily fishing from Grimsby		
Between Aug. 1, 1962 and Dec. 31, 1962	3.0	8.40
Rates for vessels under 80 feet in length:		
Vessels between 60 feet registered and 70 feet over-all length 1/	6.0	16.80
Vessels over 70 feet over-all, but under 80 feet registered length 2/	7.5	21.00

1/Includes seine-net vessels of any length up to 70 feet over-all which normally make voyages of more than 7 days.
 2/Includes seine-net vessels which meet the length requirement and which normally make voyages of more than 7 days.

The subsidy rates for other vessels under 60 feet are based on landings. The rates are: 1s. 3d. per stone (\$1.25 for 100 pounds) for whole gutted fish and certain ungutted fish; 10d. per stone (83 U. S. cents for 100 pounds) for sprats and white bait; and 1s. 1d. per stone (\$1.08 per 100 pounds) for other whole ungutted fish.

Herring Subsidy (United Kingdom) Scheme, 1962: Provides for some changes in subsidy rates on herring. The new rates apply for the 12 months ending August 31, 1963. The rates for vessels over 40 feet are as follows:

Type of Vessel	Payment Per Day at Sea		Percentage Change from Old Rate
	£	US\$	
Motor vessels between 40 and 60 feet	7.5	21.00	+15.4
Motor vessels between 60 and 80 feet	8.0	22.40	-5.9
Motor vessels over 80 feet and all steam vessels . . .	14.0	39.20	No change

The herring subsidy rate for vessels under 40 feet are based on landings and have been increased to 6d. per stone (50.0 U. S. cents for 100 pounds). This is an increase of 2½d. per stone (20.8 U. S. cents for 100 pounds) over the old rate.

White Fish and Herring Subsidies (Aggregate Amount of Grants) Order, 1962: Increases from £25.25 million (\$70.7 million) to £30.25 (\$84.7 million) the aggregate amount of grants available towards the cost of the white fish and herring subsidies.

The White Fish Industry (Grants for Fishing Vessels and Engines) Scheme, 1962: Revokes the White Fish Industry (Grants for Fishing Vessels and Engines) Scheme, 1955, and provides for the payment of grants of 30 percent of the cost, up to a maximum of £13,000 (\$36,400), for new vessels under 80 feet; 30 percent of the cost, up to a maximum of £2,500 (\$7,000), for new motors for such vessels; and 25 percent of the cost, up to a maximum of £50,000 (\$140,000) for new vessels of 80 feet or over.

Grants for new vessels may in certain circumstances be repayable during a period of ten years and grants for new motors during a period of five years. Unlike previous schemes this scheme imposes no restrictions on voyages to distant waters by grant-aided vessels and does not require the vessels or engines to be built in the United Kingdom.

The Herring Industry (Grants for Fishing Vessels and Engines) Scheme, 1962: Revokes the Herring Industry (Grants for Fishing Vessels and Engines) Scheme, 1955, and provides for grants for new herring vessels and motors similar to those provided for white fish vessels and motors under the White Fish Industry (Grants for Fishing Vessels and Engines) Scheme, 1962.

All of the Schemes, with the exception of the White Fish and Herring Subsidies (Aggregate Amount of Grants) Order, 1962, require the approval of both Houses of Parliament. The excepted Scheme only requires the approval of the House of Commons. (Fish Trades Gazette, July 7, 1962, and The Fishing News, July 13, 1962.)

Note: See Commercial Fisheries Review, February 1962 p. 96.



Viet-Nam

TWO NEW TRAWLERS ADDED TO FISHING FLEET:

Two new trawlers arrived in Saigon in the summer of 1962 to add to Viet-Nam's small fishing fleet. The two trawlers were built in Japan and imported under the commercial import program of the U. S. Agency for International Development (AID). The vessels were purchased when the limited world-wide procurement policy of AID did not apply. Each vessel has icing facilities and can carry 50 tons of fresh fish.

According to officials of the Directorate of Fisheries, only two of Viet-Nam's fleet of six trawlers were operating in the summer of 1962. Four vessels were undergoing repairs. Cambodia seized and held two additional Viet-Nam trawlers in 1961. Cambodia said the vessels were operating in their territorial waters. (United States Embassy, Saigon, August 2, 1962.)



Yugoslavia

CANNED FISH PACK UP IN 1961:

Yugoslavia's canned fish pack (all species) increased steadily each year from 7,530 metric tons in 1956 to 19,997 tons in 1961. The 1957 pack of canned fish increased 40 percent

from the previous year. In 1958, the pack was 14.2 percent higher, in 1959 the increase was 3.8 percent, and in 1960 it was 32.3 percent more than the previous year.



Women at a Yugoslav cannery preparing fish for cooking in wire baskets prior to canning operation.

The canned fish industry in Yugoslavia packs some amount of tuna. Some of the raw fish is Japanese frozen tuna. Although the 1961 canned fish pack increased 20.8 percent from the 16,545 tons packed in 1960, the amount of tuna canned that year may not have increased appreciably. Deliveries of Japanese frozen tuna to Yugoslavia were lower in 1961 because of Japan's commitments to other countries. (*Indeks*, May 1962.)



PRESERVATION OF SOME MARINE FORMS

Screw-top jars containing a formalin solution should be at hand when collecting. Also, jars should be labelled immediately after collecting. A 10% formalin solution (10 parts formalin + 90 parts water) will take care of most forms. Although for more fragile forms a 5% solution (5 parts formalin + 95 parts water) should be used. Borax should also be added. If the animal is to be dried, first preserve in 70% alcohol (70 parts alcohol - 30 parts water) with some small amount of conosive sublimate (mercuric chloride) which will permeate the animal and prevent insects from touching him.

Also, if the specimen has dried out and you wish to restore the original form, place it in a solution containing one gram of tri-sodium phosphate in one liter of water. If it had been preserved in alcohol, the original shape will be restored. After the original shape returns, transfer it to 70% alcohol. (*Sea Secrets*, The Marine Laboratory, University of Miami, Coral Gables, Fla.)

FEDERAL ACTIONS

Department of the Interior

FISH AND WILDLIFE SERVICE

BUREAU OF COMMERCIAL FISHERIES

REVISION OF FISHERIES LOAN FUND PROCEDURES:

The proposed revision of Part 250--Fisheries Loan Fund Procedures, published in the May 11, 1962, Federal Register, was adopted with minor editorial changes, and was promulgated in the Federal Register of July 19, 1962. The revision was effective at the beginning of the 30th calendar day following the date of publication in the Federal Register. Interested parties were given 30 days in which to submit written comments, sug-

gestions, or objections to the proposed changes. Two suggestions were received, and were considered in connection with the proposed changes.

The purpose of the revision is to provide for procedural changes necessitated by transfer of certain acts formerly performed by the Small Business Administration to the Department of the Interior, to clarify the meaning of several sections, and to provide published standards that insurance underwriters furnishing insurance on property serving as collateral for a fisheries loan must meet.

The revised procedures as published in the July 19, 1962, Federal Register follow:

Title 50—WILDLIFE AND FISHERIES

Chapter II—Bureau of Commercial Fishes, Fish and Wildlife Service, Department of the Interior

SUBCHAPTER F—AID TO FISHERIES

PART 250—FISHERIES LOAN FUND PROCEDURES

Revision of Procedures

On page 4517 of the FEDERAL REGISTER of May 11, 1962, there was published a notice and text of a proposed revision of Part 250. The purpose of the revision is to provide for procedural changes necessitated by transfer of certain acts formerly performed by the Small Business Administration to the Department of the Interior, to clarify the meaning of several sections, and to provide published standards that insurance underwriters furnishing insurance on property serving as collateral for a fisheries loan must meet. Due to the numerous changes being proposed, the procedures will be more readily understood if the entire part is revised.

Interested persons were given 30 days within which to submit written comments, suggestions, or objections with respect to the proposed revision. Two suggestions were received and have been considered in connection with the proposed revision. The proposed revision is hereby adopted with minor editorial changes and is set forth below. This revision shall become effective at the beginning of the 30th calendar day following the date of this publication in the FEDERAL REGISTER.

Part 250 is revised to read as follows:

Sec.	
250.1	Definition of terms.
250.2	Purposes of loan fund.
250.3	Interpretation of loan authorization.
250.4	Qualified loan applicants.
250.5	Loan applications.
250.6	Applications.
250.7	Processing of loan applications.
250.8	Approval of loans.
250.9	Interest.
250.10	Maturity.
250.11	Security.
250.12	Books, records, and reports.
250.13	Insurance required.
250.14	Penalties on default.

AUTHORITY: §§ 250.1 to 250.14 issued under sec. 4, 70 Stat. 1121; 16 U.S.C. 742c.

§ 250.1 Definition of terms.

For the purposes of this part, the following terms shall be construed, respectively, to mean and to include:

(a) *Secretary*. The Secretary of the Interior or his authorized representative.

(b) *Person*. Individual, association, partnership or corporation, any one or all as the context requires.

(c) *State*. Any State, the Territories and possessions of the United States, the Commonwealth of Puerto Rico, and the District of Columbia.

§ 250.2 Purposes of loan fund.

The broad objective of the fisheries loan fund created by the Fish and Wildlife Act of 1956 is to provide financial assistance which will aid the commercial fishing industry to bring about a general upgrading of the condition of both fishing vessels and fishing gear thereby contributing to more efficient and profitable fishing operations.

(a) Under section 4 of the act, the Secretary is authorized, among other things:

(1) To make loans for financing and refinancing of operations, maintenance, replacement, repair and equipment of fishing gear and vessels, and for research into the basic problems of fisheries.

(2) Subject to the specific limitations in the section, to consent to the modification, with respect to the rate of interest, time of payment of any installment of principal, or security, of any loan contract to which he is a party.

(b) All financial assistance granted by the Secretary must be for one or more of the purposes set forth in paragraph (a) of this section.

§ 250.3 Interpretation of loan authorization.

The terms used in the act to describe the purposes for which loans may be granted are construed to be limited to the meanings ascribed in this section.

(a) *Operation of fishing gear and vessels*. The words "operation of fishing gear and vessels" mean and include all phases of activity directly associated with the catching of fish and shellfish for commercial purposes, except the construction of new vessels.

(b) *Maintenance of fishing gear and vessels*. The words "maintenance of fishing gear and vessels" mean and include the normal and routine upkeep of all parts of fishing gear and fishing vessels, including machinery and equipment.

(c) *Replacement of fishing gear and vessels*. The words "replacement of fishing gear and vessels" contemplate the purchase of fishing gear or equipment, parts, machinery, or other items incident to outfitting for fishing to replace lost, damaged, worn, obsolete, inefficient, or discarded items of a similar nature, or the purchase or construction of a fishing vessel to operate the same type of fishing gear as a comparable

vessel which has been lost, destroyed or abandoned or has become obsolete or inefficient. Any vessel lost, destroyed or abandoned more than two years prior to the date of receipt of the application shall not be considered eligible for replacement. In order to be eligible for replacement an obsolete or inefficient vessel must be permanently removed from commercial fishing, and if sold, must be sold subject to an agreement that it will not reenter the commercial fishery.

(d) *Repair of fishing gear and vessels.* The words "repair of fishing gear and vessels" mean the restoration of any worn or damaged part of fishing gear or fishing vessels to an efficient operating condition.

(e) *Equipment of fishing gear and vessels.* The words "equipment of fishing gear and vessels" mean the parts, machinery, or other items incident to outfitting for fishing which are purchased for use in fishing operations.

(f) *Research into the basic problems of fisheries.* The words "research into the basic problems of fisheries" mean investigation or experimentation designed to lead to fundamental improvements in the capture or landing of fish conducted as an integral part of vessel or gear operations.

§ 250.4 Qualified loan applicants.

(a) Any person residing or conducting business in any State shall be deemed to be a qualified applicant for financial assistance if such person:

(1) Owns a commercial fishing vessel of United States registration (if registration is required) used to be used directly in the conduct of fishing operations, irrespective of the type, size, power, or other characteristics of such vessel;

(2) Owns any type of commercial fishing gear used directly in the catching of fish or shellfish;

(3) Owns any property, equipment, or facilities useful in conducting research into the basic problems of fisheries or possesses scientific, technological or other skills useful in conducting such research;

(4) Is a fishery marketing cooperative engaged in marketing all catches of fish or shellfish by its members pursuant to contractual or other enforceable arrangements which empower the cooperative to exercise full control over the conditions of sale of all such catches and disburse the proceeds from all such sales.

(b) Applications for financial assistance cannot be considered if the loan is to be used for:

(1) Any phase of a shore operation.

(2) Refinancing existing loans that are not secured by the fishing vessel or gear, or debts which are not maritime liens within the meaning of subsection P of the Ship Mortgage Act of 1920, as amended (46 U.S.C. 971).

(3) Refinancing existing mortgages or secured loans on fishing vessels and gear, or debts secured by maritime liens, except in those instances where the Secretary deems such refinancing to be desirable in carrying out the purpose of the Act.

(4) (i) Effecting any change in ownership of a fishing vessel (except for replacement of a vessel or purchase of the interest of a deceased partner), (ii) replenishing working capital used for such purpose or (iii) liquidating a mortgage given for such purpose less than 2 years prior to the date of receipt of the application.

(5) Replacement of fishing gear or vessels where the applicant or applicants owned less than a 20-percent interest in

said fishing gear or vessel to be replaced or owned less than 20-percent interest in a corporation owning said fishing gear or vessel; *Provided*, That applications for a replacement loan by an eligible applicant cannot be considered unless and until the remaining owners or shareholders shall agree in writing that they will not apply for a replacement loan on the same fishing gear or vessel.

(6) Repair of fishing gear or vessels where such fishing gear or vessels are not offered as collateral for the loan by the applicant.

(7) Financing a new business venture in which the controlling interest is owned by a person or persons who are not currently engaged in commercial fishing.

§ 250.5 Basic limitations.

Applications for financial assistance may be considered only where there is evidence that the credit applied for is not otherwise available or reasonable terms from the applicant's bank of account, (b) from the disposal at a fair price of assets not required by the applicant in the conduct of his business or not reasonably necessary to its potential growth, (c) through use of the personal credit and/or resources of the owner, partners, management, affiliates or principal stockholders of the applicant, or (d) from other known sources of credit. The financial assistance applied for shall be deemed to be otherwise available on reasonable terms unless it is satisfactorily demonstrated that proof of refusal of the desired credit has been obtained from the applicant's bank of account: *Provided*, That if the amount of the loan applied for is in excess of the legal lending limit of the applicant's bank or in excess of the amount that the bank normally lends to any one borrower, then proof of refusal should be obtained from a correspondent bank or from any other lending institution whose lending capacity is adequate to cover the loan applied for. Proof of refusal of the credit applied for must contain the date, amount, and terms requested. Bank refusals to advance credit will not be considered the full test of unavailability of credit and, where there is knowledge or reason to believe that credit is otherwise available on reasonable terms from sources other than such banks, the credit applied for cannot be granted notwithstanding the receipt of written refusals from such banks.

§ 250.6 Application.

Any person desiring financial assistance from the fisheries loan fund shall make application to the Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior, Washington 25, D.C., on a loan application form furnished by that Bureau except, in the discretion of the Secretary, an application made other than by use of the prescribed form may be considered if the application contains information deemed to be sufficient. Such application shall indicate the purposes for which the loan is to be used, the period of the loan, and the security to be offered.

§ 250.7 Processing of loan applications.

If it is determined, on the basis of a preliminary review, that the application is complete and appears to be in conformity with established rules and procedures, a field examination shall be made. Following completion of the field investigation the application will be forwarded with an appropriate report to the Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior, Washington 25, D.C.

§ 250.8 Approval of loans.

The Secretary will evidence his approval of the loan by issuing a loan authorization covering the terms and conditions for making the loan. Documents executed in connection with a loan shall be in a form approved by the Secretary. Any modification of the terms of a loan following its execution must be agreed to in writing by the borrower and the Secretary.

§ 250.9 Interest.

The rate of interest on all loans which may be granted is fixed at 5 percent per annum.

§ 250.10 Maturity.

The period of maturity of any loan which may be granted shall be determined and fixed according to the circumstances but in no event shall the date of maturity so fixed exceed a period of 10 years.

§ 250.11 Security.

Loans shall be approved only upon the furnishing of such security or other reasonable assurance of repayment as the Secretary may require. The proposed collateral for a loan must be of such a nature that, when considered with the integrity and ability of the management, and the applicant's past and prospective earnings, repayment of the loan will be reasonably assured.

§ 250.12 Books, records, and reports.

The Secretary shall have the right to inspect such books and records of the applicant as the Secretary may deem necessary. Disbursements on a loan made under this part shall be made only upon the agreement of the loan applicant to maintain proper books of account and to submit such periodic reports as may be required by the Secretary during the period of the loan. During such period, the books and records of the loan applicant shall be made available at all reasonable times for inspection by the Secretary.

§ 250.13 Insurance required.

(a) If insurance of any type is required on property under the terms of a loan authorization or mortgage it must be in a form approved by the Secretary and obtained from an underwriter satisfactory to the Secretary and meeting at least one of the following requirements:

(1) An underwriter licensed by an insurance regulatory agency of a State to write the particular form of insurance being written.

(2) A foreign insurance company or club operating in the United States that has deposited funds in an amount and manner satisfactory to the Secretary in a bank chartered under the laws of a State or the United States of America, or in a trust fund satisfactory to the Secretary, which funds are solely for the payment of insurance claims of United States vessels.

(3) A reciprocal or interinsurance exchange licensed by an insurance regulatory agency of a State to write the particular form of insurance being written.

(4) An insurance pool composed entirely of owners and operators of fishing vessels.

(5) Any underwriter (including a company, club, or pool) writing such insurance shall furnish such reasonable financial or operating data as the Secretary may require to determine the standing and responsibility of said underwriter.

§ 250.14 Penalties on default.

Unless otherwise provided in the loan documents, failure on the part of a borrower to conform to the terms of the loan documents will be deemed grounds upon which the Secretary may cause any one or all of the following steps to be taken:

- (a) Discontinue any further disbursements of funds contemplated by the loan documents.

- (b) Take possession of any or all collateral given as security and the property purchased with borrowed funds.

- (c) Prosecute legal action against the borrower.

- (d) Declare the entire amount of the loan immediately due and payable.

- (e) Prevent further disbursement of any funds remaining under his control.

STEWART L. UBALL,
Secretary of the Interior.

JULY 12, 1962.



Eighty-Seventh Congress

(Second Session)

 Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

ANTIDUMPING ACT AMENDMENT: Introduced in the Senate, S. 3606 (Humphrey) on Aug. 3, and S. 3658 (Case) on Aug. 21, 1962, to amend certain provisions of the Antidumping Act, 1921, to provide for greater certainty, speed, and efficiency in the enforcement thereof, and for other purposes; referred to the Committee on Finance. Similar to other bills previously introduced.

FISH PROTEIN CONCENTRATE: The Subcommittee on Health and Safety of the House Committee on Interstate Commerce, held public hearings on Aug. 8 and 9, 1962, on H.R. 9101, 9102, and 9331 (identical bills), to amend clause (3) of section 402(a) of the Federal Food, Drug, and Cosmetic Act. Amends act so that "no processed seafood product shall be deemed to consist of any such substance or to be otherwise unfit for food because such processed seafood product is derived from whole fish, provided such product is processed under sanitary conditions and after processing is nutritious and in no manner harmful to the health of consumers thereof." Namely, it provides that a processed seafood product can be produced from whole fish and not be considered adulterated.

FOOD AND AGRICULTURE ACT OF 1962: The Senate on Aug. 21, 1962, resumed consideration of H.R. 12391, Food and Agriculture Act of 1962, to improve and protect farm income, to reduce costs of farm pro-

grams to the Federal Government's excessive stocks of agricultural commodities, to maintain reasonable and stable prices of agricultural commodities and products to consumers, to provide adequate supplies of agricultural commodities for domestic and foreign needs, to conserve natural resources, and for other purposes; in lieu of S. 3225, the Senate version of the same bill, Senator Ellender introduced an amendment on behalf of Senator Fulbright (Ark.) to H.R. 12391, which amendment had been unanimously agreed to by the Senate when it was considering S. 3225. The amendment reads "Sec. 343. As used in this title (1) the term 'farmers' shall be deemed to include persons who are engaged in, or who, with assistance afforded under this title, intend to engage in, fish farming, and (2) the term 'farming' shall be deemed to include fish farming." This is an amendment to a Committee amendment. The Senate agreed to the amendment of the Senator from Ark. A motion to reconsider the amendment was tabled.

The Senate on Aug. 22, 1962, passed with Committee amendment (in nature of a substitute) H.R. 12391. Senate insisted on its amendment, asked for conference with House, and appointed conferees.

GLOUCESTER HARBOR (MASS.) IMPROVEMENT: S. Rept. 1777, Authorizing Modification of the Project for Gloucester Harbor, Mass. (Report from the Committee on Public Works, United States Senate, 87th Congress, 2nd Session, July 23, 1962, to accompany S. 3544, 7 pp., printed). The Committee reported favorably thereon and recommended passage of the bill. Contains purpose of the bill, description of project, Committee views, and agency comments.

The Senate on Aug. 2, 1962, passed S. 3544, to authorize modification of the project for Gloucester Harbor, Mass. This bill authorizes the deepening of Gloucester Harbor to 20 feet and provides turning and anchorage basins.

HEALTH, EDUCATION, AND WELFARE APPROPRIATIONS FY 1963: S. Rept. 1672, Departments of Labor, and Health, Education, and Welfare, and Related Agencies Appropriation Bill, 1963 (June 29, 1962), a report from the Committee on Appropriations, to accompany H.R. 10904, making appropriations for the Departments of Labor, and Health, Education, and Welfare, and related agencies for the fiscal year ending June 30, 1963, and for other purposes. Included is \$959,000 to equip and properly staff the two shellfish laboratories on the East and Gulf Coasts of the United States; also funds for research grants for shellfish technology and marine ecology, shellfish sanitation, water pollution control, and vocational training (including fisheries).

The Senate on July 20, 1962, passed H.R. 10904 amended. Senate insisted on its amendments, asked for conference with the House and appointed conferees. Conference was held July 25, 1962, and the report filed July 31, 1962 (H. Rept. 2100).

H. Rept. 2100, Departments of Labor, and Health, Education, and Welfare, and Related Agencies Appropriation Bill, 1963 (July 31, 1962), a report from the Committee on Conference to accompany H.R. 10904. The Committee on Conference came to agreement and presented their recommendations to their respective Houses.

The House on Aug. 1, 1962, adopted the conference report and the Senate on Aug. 2, 1962, also agreed to conference report, thus clearing the bill for the President's signature.

The President on Aug. 14, 1962, signed H.R. 10904, fiscal 1963 appropriations for the Departments of Labor and Health, Education and Welfare (P. L. 87-582).

EXEMPT TRANSPORTATION OF AGRICULTURAL AND FISHERY PRODUCTS: The House Committee on Interstate and Foreign Commerce met Aug. 7 through 10, 1962, on H.R. 11583, to exempt certain carriers from minimum rate regulation in the transportation of bulk commodities, agricultural and fishery products, and passengers, and for other purposes. The Committee on Aug. 10, concluded hearings on H.R. 11583. Testimony was given by personnel of various agencies and industry. Hearings adjourned subject to the call of the Chair.

The Senate Committee on Commerce, July 27, 1962, concluded hearings on S. 3243, to exempt certain carriers from minimum rate regulation in the transportation of bulk commodities, agricultural and fishery products, and passengers, and for other purposes. Testimony was heard from various Federal agencies and Congressmen. The hearings were recessed subject to call. The Senate Committee on Aug. 22 and 23, 1962, resumed hearings on S. 3243.

INCOME TAX REVISION IN FAVOR OF FISHERMEN: The Senate Committee on Finance, in executive session, Aug. 3, 1962, ordered favorably reported H.R. 6413, to extend to fishermen the same treatment accorded farmers in relation to estimated income tax. The Senate, the same date, received the report (S. Rept. No. 1819) from the Committee.

S. Rept. 1819, Declaration of Estimated Income Tax by Fishermen (Report from the Committee on Finance, United States Senate, 87th Congress, 2nd Session, Aug. 3, 1962, to accompany H.R. 6413), 7 pp., printed. The Committee reported favorably with amendments and recommended passage of the bill. Contains a summary of House provision, summary of Committee amendment, a general explanation of the House provision and Committee amendment, and changes in existing laws. The House bill provides that, for purposes of the estimated income tax, fishermen are to be accorded the same treatment as is presently available for farmers. The Committee amendment makes the extra 10-percent limitation on deduction of charitable contributions (presently available in the case of contributions to a church, school, hospital, or medical research organization) available also in the case of contributions to an organization which normally receives a substantial part of its support from the United States or any State or political subdivision thereof or from direct or indirect contributions from the general public, organized and operated exclusively to receive, hold, invest, and administer property and to make expenditures to or for the benefit of a State university or college, including a land-grant college or university. This provision is to apply to taxable years beginning after Dec. 31, 1960.

The Senate on Aug. 8, 1962, passed over H.R. 6413.

INDIAN FISHING RIGHTS: H.J. Res. 838 (Tollefson introduced in the House on July 25, 1962, regarding Indian fishing rights; referred to the Committee on Interior and Insular affairs. Similar to other bills previously introduced. Proposes to solve the problem of treaty and non-treaty Indians fishing off the reservation in violation of State regulations.

INTERIOR APPROPRIATIONS FY 1963: The House on July 26, 1962, agreed to a conference with the Senate on H.R. 10802, making appropriations for the Department of the Interior and related agencies for the fiscal year ending June 30, 1963, and for other purposes. The House appointed the following conferees: Messrs. Kirwan, Magnuson, Cannon, Jensen, and Taber. The conferees met on July 27, 1962.

The Senate and the House held a joint conference, in executive session, July 27, 1962, on H.R. 10802.

H. Rept. 2049, Department of the Interior and Related Agencies Appropriation Bill, 1962 (July 27, 1962, a report from the Committee of Conference on H.R. 10802), 11 pp., printed. The Committee of Conference came to agreement and presented their recommendations to the respective Houses. Included are funds for the Bureau of Commercial Fisheries, the Bureau of Sport Fisheries and Wildlife, and the Commissioner's Office. The conferees agreed to appropriate to the Bureau of Commercial Fisheries the following appropriations of \$15,225,000 for management and investigation of resources instead of \$14,600,000 as proposed by the House and \$15,981,000 as proposed by the Senate. The increase over the House allowance provides for \$325,000 for expanded biological research on shrimp in the Gulf of Mexico; \$100,000 for research and development of shrimp gear; and \$200,000 for Atlantic herring research; and appropriations of \$8,473,000 for construction as proposed by the Senate instead of \$7,900,000 as proposed by the House. The increase provides for \$413,000 for equipment for the laboratories at Seattle, Wash., and Ann Arbor, Mich., and \$160,000 for purchase of land and land filling to initiate construction of the Shellfish Research Center at Milford, Conn. Granted to the Bureau of Sport Fisheries and Wildlife was \$27,112,000 for management and investigation of resources, which included \$100,000 for technical assistance in sport fishing management through cooperative programs with Indian tribes; \$150,000 for establishing new cooperative fishery units at five institutions; \$105,000 for increased fish control research in the southeastern United States; \$85,000 for increased reservoir research in the White River interstate reservoir complex of Arkansas and Missouri; and \$25,000 for continuing a fishery management project at Springville, Utah. Construction funds included \$125,000 for improvements at the Federal Fish Farm Experiment Station, Kelso, Arkansas; \$340,000 for the establishment of a fish genetics facility in Wyoming; and 11 fish hatcheries. Appropriation for the Office of the Commissioner was \$364,000.

The House on July 30, 1962, received the conference report (H. Rept. No. 2049), on H.R. 10802. The House in a voice vote adopted the conference report and sent the legislation to the Senate.

The Senate on Aug. 1, 1962, adopted the conference report (H. Rept. No. 2049) on H.R. 10802, thereby clearing the bill for the President's signature.

The President, on Aug. 9, 1962, signed H.R. 10802 (P.L. 87-578).

INTERNATIONAL FISHERIES ORGANIZATIONS: United States Contributions to International Organizations (Letter from the Acting Secretary of State Transmitting the 10th Report on the Extent and Disposition of U.S. Contributions to International Organizations for

the Fiscal Year 1961, Pursuant to Section 2 of Public Law 806, 81st Congress), H. Doc. 460, 146 pp., printed. It is the annual report presented to Congress on the United States contributions to International Organizations by the Secretary of State. Included are reports on the following international fisheries organizations: Inter-American Tropical Tuna Commission; International Commission for the Northwest Atlantic Fisheries; International North Pacific Fisheries Commission; International Whaling Commission; and North Pacific Fur Seal Commission. It also contains a chart showing the estimated contributions from 1946 to 1962.

MEDICAL CARE FOR VESSEL PERSONNEL: The Subcommittee on Health and Safety of the House Committee on Interstate Commerce announced that public hearings were held on Aug. 13, 1962, on H.R. 3797, 8029, 10921, and 11920, to provide medical care for certain persons engaged on board a vessel in the care, preservation, or navigation of such vessel. Owner-fishermen and all persons employed as fishermen on board United States registered, enrolled, and licensed commercial fishing vessels could be considered for eligibility for the medical and dental services that are provided for seamen.

NATIONAL FISHERIES CENTER AND AQUARIUM: S. Report No. 1782, Authorizing the Administrator of General Services to Construct a National Fisheries Center and Aquarium in the District of Columbia (July 23, 1962, Report of the Committee on Public Works, United States Senate, 87th Congress, 2nd Session, to accompany H.R. 8181, to authorize the construction of a National Fisheries Center and Aquarium in the District of Columbia and to provide for its operation), 15 pp., printed. Committee reported bill favorably, with amendments, and recommended passage. Contains purpose of the bill, hearings, amendments, general statement, committee views, estimated Federal cost, and agency comments. The purpose of the bill as amended is to authorize the Administrator of General Services to plan, construct, and maintain a National Fisheries Center and Aquarium in the District of Columbia or its vicinity, for the display of freshwater, marine, and shell fish and other aquatic resources for educational, recreational, cultural, and scientific purposes. The facility would be operated by the Secretary of the Interior, who would assign such responsibility to that branch of the Bureau of Sport Fisheries and Wildlife having as its major activity the rearing and holding of living fish, including the operation of aquariums. A non-partisan advisory board would be established to render advice and to submit recommendations to the Secretary concerning the management and operation of the Center and Aquarium. The cost would not exceed \$10 million, and the Secretary will establish charges for visits to the Center and Aquarium, and for other uses, at such rates that will produce sufficient revenues to cover an appropriate share of its annual operation and maintenance costs.

NATIONAL FISHERIES PROBLEMS: In the Senate on Aug. 3, 1962, Senators Magnuson, Bartlett, and Smith (Mass.) discussed at length (Congressional Record, Aug. 3, 1962, pp. 14565-14571) national fisheries problems. Attention was called to the decline of our United States fisheries while foreign nations have taken action to expand and modernize their own fishing fleets. Sen. Magnuson stated: "Our own fishing fleets composed of small and ancient ships equipped with long outdated gear are disintegrating." It was further brought out that a few years ago the United States

commercial fishery catch was exceeded only by Japan. Today we are topped also by Soviet Russia, Communist China, and Peru. Also incorporated in the Record is the speech given by the Assistant Secretary of the Interior for Fish and Wildlife, Frank P. Briggs, "Fisherries in a Changing World," at the Annual Convention of the Oyster Institute of North America in Baltimore, Md., on July 31, 1962. Sen. Bartlett, in introducing an amendment (Congressional Record, Aug. 3, 1962, pp. 14563-65) to the Trade Expansion Act of 1962 (H.R. 11970), which would protect the United States fisheries, also discussed national fisheries problems and the fishing of foreign nations off our coasts.

OCEANOGRAPHIC RESEARCH: The Subcommittee on Oceanography of the House Committee on Merchant Marine and Fisheries met Aug. 9, 1962, on H.R. 12601, to provide for a comprehensive, long-range, and coordinated national program in oceanography and for other purposes. The Subcommittee ordered reported favorably to the full committee H.R. 12601, amended.

The House Committee on Merchant Marine and Fisheries, Aug. 14, 1962, met in executive session and ordered reported favorably to the House H.R. 12601 amended. The House on the same date received the report (H. Rept. 2221) from the Committee; referred to the Committee of the Whole House on the State of the Union.

H.R. 12601 was passed by the House on Aug. 20. The language of H.R. 12601 then was substituted for S. 901, a similar bill passed by the Senate on July 28, 1961. Then S. 901 was passed by the House on Aug. 20, 1962. It was sent to the Senate for concurrence as amended. Senate received S. 901 (amended) as passed by the House on Aug. 21, 1962.

OYSTER BROOD STOCK PURCHASES: The House on July 30, 1962, concurred with the Senate amendments to H.R. 7336, to promote the production of oysters by propagation of disease-resistant strains, and for other purposes.

On Aug. 9, 1962, the President signed H.R. 7336 (P.L. 87-580). The Secretary of the Interior is authorized to acquire oyster brood disease-resistant stock for transfer to the particular States involved for planting in spawning sanctuaries. Distribution of the resultant seed oysters by the States shall be in accordance with the plans and procedures that are mutually acceptable to the Secretary and the cooperating States. The purchase of the stock by the Secretary shall be conditional upon the participating State or States, in each instance, paying one-third of the cost of such stock. The Secretary is authorized to make grants to the States for the purpose of assisting such States in the financing of research and other activities necessary in the development and propagation of disease-resistant strains of oysters. A grant shall be made upon agreement by the State to use the proceeds thereof only for the purposes specified and to use an additional amount for such purposes from State or other non-Federal sources equal to at least 50 percent of the amount of such grant. Federal Government total appropriation for such grants is \$100,000.

POTOMAC RIVER COMPACT (MD. & VA.) OF 1958: H. Rept. 1980, Potomac River Compact (July 17, 1962, report from the Committee on the Judiciary, to accompany H.J. Res. 659), 4 pp., printed. The Committee reported favorably thereon without amendment and recommended that the resolution be passed. Contains the purpose, statements, and agency reports.

The House on Aug. 6, 1962, passed H. J. Res. 659, granting consent of the Congress to a compact entered into between the State of Maryland and the Commonwealth of Virginia for the creation of the Potomac River Compact of 1958. Gives Maryland and Virginia permission to set up a Potomac River Fisheries Commission. It would regulate through three members from each State the taking of fish and shellfish from the Potomac River between the District of Columbia line and Chesapeake Bay. Research, regulation of fisheries, an oyster inspection fee and licensing would be within the power of the new commission. The compact succeeds an obsolete agreement of 1785, which has been disputed by the States. The bill was sent to the Senate.

PRICE-QUALITY STABILIZATION: H. J. Res. 832 (Mason) and H. J. Res. 833 (Nelson) introduced in the House on July 25, 1962, to amend the Federal Trade Commission Act, to promote quality and price stabilization to define and restrain certain unfair methods of distribution and to confirm, define, and equalize the rights of producers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes; referred to the Committee on Interstate and Foreign Commerce.

The Special Fair Trade Subcommittee of the Senate Committee on Commerce, on July 25, 1962, met in executive session and approved for full committee consideration with amendments S.J. Res. 159, to promote quality and price stabilization.

The Subcommittee on Commerce and Finance of the House Committee on Interstate and Foreign Commerce, Aug. 2, 1962, ordered reported favorably to the full committee, H.J. Res. 636.

H.J. Res. 857 (MacGregor) introduced in the House on Aug. 16, 1962; referred to the Committee on Interstate and Foreign Commerce. Similar to other bills previously introduced.

SCIENCE AND TECHNOLOGY COMMISSION: Create a Commission on Science and Technology (Hearings before the Committee on Government Operations, United States Senate, 87th Congress, 2nd Session, on S. 2771 to provide for the establishment of a Commission on Science and Technology, Part 2, July 24, 1962), 74 pp., printed. Contains information on the hearing, and statements and communications from various Federal agencies and industry personnel.

The Senate Committee on Government Operations, Aug. 2, 1962, ordered favorably reported with amendments S. 2771 for the establishment of a Commission on Science and Technology. The Senate on Aug. 6, 1962, received the report (S. Rept. No. 1828) on S. 2771. The bill provides for the establishment of a Hoover-type commission composed of representatives from a legislative and executive branches of the Government and of persons from private life who are eminent in one or more fields of science or engineering, or who are qualified and experienced in policy determination and administration of industrial scientific research and technological activities. The objectives of the proposed Commission provide for a study of all of the programs, methods, and procedures of the Federal departments and agencies which are operating, conducting, and financing scientific programs, with the purpose of bringing about more economy and efficiency in the performance of these essential activities and

functions. Emphasis has also been directed toward the need for developing a program for the elimination of duplication in science efforts, where one agency of Government works on programs which are under way in other agencies, or where research is being done on problems which have already been solved by other scientists. The Commission also would be specifically directed to study and recommend ways and means of meeting our scientific manpower needs. In undertaking its studies the Commission would be vested with authority to set up a Science Advisory Panel of outstanding science, engineering and technological authorities from all sections of the Nation to assist it in the performance of the functions outlined in the bill.

S. Rept. 1828, Establishment of a Commission on Science and Technology (Aug. 6, 1962, Report of the Committee on Government Operations, United States Senate, 87th Congress, 2nd Session, on S. 2771), 54 pp., printed. The Committee reported favorably with amendments and recommended passage of the bill. Contains an analysis of provisions of the bill, Committee amendments, background, and abstracts from hearings on the bill. The Committee amendments, which are of a technical and perfecting nature, were adopted with a view to further clarify the purpose and objectives of the proposed legislation.

The Senate on Aug. 8, 1962, passed with amendments S. 2771. The bill was sent to the House.

The House, Aug. 9, 1962, received from the Senate S. 2771; referred to the Committee on Science and Astronautics.

SPORT FISH RESEARCH: S. 1542 (McGee) introduced in the Senate on Apr. 12, 1961, to authorize the Secretary of the Interior to conduct studies of the genetics of sport fish and to carry out selective breeding to develop strains with inherent attributes valuable in programs of research, fish hatchery production, and management of recreational fishery resources. Would authorize the Secretary of the Interior to establish fishery research laboratories. The Senate Committee on Commerce, on Aug. 7, 1962, reported favorably (S. Rept. No. 1857) on S. 1542 with amendments.

S. Rept. 1857, Studies of Genetics of Sport Fishes (Report from the Committee on Commerce, United States Senate, 87th Congress, 2nd Session, August 7, 1962, to accompany S. 1542), 5 pp., printed. The Committee reported favorably with amendments and recommended that the bill be passed. Contains purpose of the bill, costs, and agency reports.

The Senate on Aug. 9, 1962, passed with amendments S. 1542. Cleared for the House.

The House on Aug. 13, 1962, received from the Senate S. 1542; referred to the Committee on Merchant Marine and Fisheries.

STERN RAMP TRAWLERS: S. 3610 (Magnuson and others) introduced in the Senate on Aug. 3, 1962, to authorize the Secretary of the Interior to construct two modern stern ramp trawlers to be used for research, and for other purposes; referred to the Committee on Commerce. The trawlers (one for the West Coast and one for the East Coast) would have scientific facilities suitable for use as research vessels and for the development of advanced technology for the production, preparation, processing, and preservation of fishery products, including those from areas distant from

ports and subject to severe climatic difficulties. The vessels would be prototype vessels for United States fisheries fleets of the future. It requires that any disposal of fishery products caught and processed must be done with due regard to the possible impact on the domestic fisheries industry and in a manner to avoid adverse effects upon domestic prices or current market demands. The bill would help our own fisheries industry compete against the massive foreign fishing fleets now operating off our shores. The Interior Secretary would have the option of chartering these vessels or operating them himself, but charters would be subject to certain conditions and stipulations. Companion bills H.R. 12848 (Bates) and H.R. 12928 (MacDonald) were introduced in the House on Aug. 9 and 16, 1962, respectively, also H.R. 12959 (Glenn) on Aug. 23; all referred to the Committee on Merchant Marine and Fisheries.

SUPPLEMENTAL APPROPRIATIONS FY 1963: The House on Aug. 13, 1962, received a communication from the President (H. Doc. No. 514) transmitting proposed supplemental appropriations for the fiscal year 1963 for the Judiciary, the District of Columbia, and various agencies of the Executive Branch. Includes funds for the Bureau of Commercial Fisheries in the amount of \$500,000 for research and development of processes to produce a concentrated protein from fish. This program is based on the results of a survey of scientific and development work on this subject under way in other countries which were not available when the 1963 budget was presented. Because of the growing need for a low-cost, dietary supplement of animal protein in many countries, the potential benefits to the fishing industry, and for the improved conservation of fishery resources, a research and development program should be started at this time.

H. Doc. 514, Supplemental Appropriations for the Judiciary, the District of Columbia, and Various Agencies of the Executive Branch (Communication from the President of the United States transmitting proposed supplemental appropriations for the fiscal year 1963 in the amounts of \$20,000 for the Judiciary and \$10,886 for the District of Columbia, proposed supplemental appropriations for the fiscal years 1962 and 1963 in the amount of \$595,826,000, and requests for consideration of four items transmitted in the 1963 budget for various agencies of the Executive Branch), 87th Congress, 2nd Session, House of Representatives, 19 pp., printed. Included are funds for the Bureau of Commercial Fisheries in the amount of \$500,000 for research and development of processes to produce a concentrated protein from fish.

TECHNOLOGICAL LABORATORY LAND IN MARYLAND: The House Subcommittee on Public Lands of the Committee on Interior and Insular Affairs met in executive session on July 27, 1962, and ordered reported favorably to the full committee H.R. 8362, amended, to provide for the conveyance of certain real property of the United States to the State of Maryland. Property affected is the site of the Bureau of Commercial Fisheries Technological Laboratory at College Park, Md.

TRADE EXPANSION ACT OF 1962: Senator Bartlett, Aug. 3, 1962, introduced an amendment to the Trade Expansion Act of 1962, H.R. 11970, to promote the general welfare, foreign policy, and security of the United States through international trade agreements and through adjustment assistance to domestic

industry, agriculture, and labor, and for other purposes. The amendment is offered to section 252(b) of chapter 6, title II, that portion of the trade bill which specifies the conditions under which the President can withhold or withdraw from a particular country the benefits of trade concessions given to all countries. The amendment offers two additional circumstances under which the President may take this action, and it supplements the authority given him under the present bill by adding the power to impose import quotas and embargoes, all intended to guarantee the preservation of our fishery resources.

In its present form, section 252(b) permits the President to suspend or withdraw any trade concession to a nation which engages in an action that burdens or restricts United States commerce. With the addition of this amendment, the President can take the same action when another country permits its citizens to engage in fishing activities which will defeat the effort of our States and our Federal Government to conserve our fishery resources or when a foreign government allows its nationals to harass or interfere with our fishermen on the high seas while they are engaged in lawful activities. With this amendment, the President can not only maintain present tariffs with regard to a specific country, which is engaging in practices which do violence to our conservation efforts, but if appropriate, he can also increase our present tariff, for example, on canned salmon and crab from 15-1/2 percent ad valorem to 25 percent. This can be done without changing tariffs on fresh or frozen salmon and crab which may be considered an important source of supply. This amendment also gives the President flexible powers to adjust imports by another action including the use of import quotas or embargoes.

Paragraph (c) of section 252 states that the President shall provide an opportunity for a hearing and public presentation of views on these problems. In the event a foreign country is violating principles of fishery and resources conservation, this provision, with the amendment, amply insures that any person shall have adequate opportunity to protest.

Senator Javitts, Aug. 7, 1962, submitted to the Senate 8 amendments to H.R. 11970. They were printed in the Congressional Record, Aug. 7, 1962, pp. 14705-14706. Proposed amendment A would authorize the President to eliminate tariffs on a mutual basis with all fully developed countries or areas of the free world, provided that the most substantial concessions are made on the products of the strongest United States industries. Amendment B provides for the use of authority for the purpose of getting the fully developed nations to share the burden of providing markets for the developing nations--a burden which the United States has been carrying to a large extent alone. Proposed amendment C is designed to facilitate the escalation of international labor standards and to place greater pressure on exporting ports to refrain from subsidizing their exports through artificially depressed wages. Amendment D would specify infringements of United States patents, copyrights, and registered trademarks as actions unjustifiably restricting United States commerce and as cause for retaliatory action by the United States. Amendment E would provide for a termination date (June 30, 1974) for the certification of firms and workers eligible for adjustment assistance; would provide for such termination through concurrent resolution of the Congress. Amendment F would require the President to submit a detailed report on ex-

penditures and commitments under the adjustment assistance program, in connection with the annual report on the administration of the entire Trade Expansion Act now required by H.R. 11970. Proposed amendment G would require the Tariff Commission to keep up to date and publish at least every 5 years "Summaries on Tariff Information." Amendment H would establish council advisers, composed of representatives of major industry, agriculture, and labor groups. Its chairman would be the special representative for trade negotiations. Congressional delegates to negotiations would be ex officio members of the council.

On August 16, 1962, the Senate Committee on Finance concluded hearings on H.R. 11970. Testimony was received from Congressmen, various Federal agencies, and industry personnel.

Sen. Pell on Aug. 15, 1962, in the Senate, introduced several amendments to H.R. 11970. One amendment directs the Secretary of Labor to compile a comparative real wage index which would contrast the average real wages or earnings--in terms of purchasing power--for a worker in an American industry with the average real wages or earnings for a worker in the same industry in a country with which we would be negotiating an agreement. The second amendment would make grants, in addition to loans, available to firms for the purpose of acquiring and installing new machinery, or modernizing or converting existing machinery. An additional amendment concerns a community which has a firm or firms with deep roots in the economical life of that community. This amendment would authorize such a community, which suffers serious injury through idling of productive facilities and unemployment resulting from expanded imports, to apply for adjustment assistance. This would include technical assistance and appropriate financial assistance for public facilities which would materially contribute to the economic adjustment of the particular community.

TRANSPORTATION ACT OF 1962: The House Committee on Interstate and Foreign Commerce met Aug. 7 through 10, 1962, on H.R. 11584, to provide for strengthening and improving the national transportation system, and for other purposes.

The House Committee on Aug. 10, 1962, concluded hearings on H.R. 11584. Testimony was given by personnel of various agencies and industry. Hearings adjourned subject to the call of the Chair.

The Senate Committee on Commerce, July 27, 1962, concluded hearings on S. 3242, to provide for strengthening and improving the national transportation system, and for other purposes. Testimony has been heard from various Federal agencies, congressmen. The hearings were recessed subject to call.

The Senate Committee on Aug. 22 and 23, 1962, resumed hearings on S. 3242, to provide for strengthening and improving the national transportation system, and for other purposes.

TUNA CONVENTION ACT OF 1950: Conservation of Tropical Tuna (Hearings before the Merchant Marine and Fisheries Subcommittee of the Committee on Commerce, United States Senate, 87th Congress, 2nd Session, on S. 2568, a bill to amend the act of September 7, 1950, to extend the regulatory authority of the Federal and state agencies concerned under the terms of the convention for the establishment of an Inter-American Tropical Tuna Commission, signed at Washington, May 31, 1949, and for other purposes.), 128 pp., printed. Contains hearings held May 23, 24, 1962, on S. 2568; testimonies, letters, and reports from various Federal agencies and industry representatives are included.

VESSEL CONSTRUCTION SUBSIDY AMENDMENTS: S. 3611 (Magnuson and others) introduced in the Senate, Aug. 3, 1962, to amend the Act of June 12, 1960, for the correction of inequities in the construction of fishing vessels, and for other purposes; referred to the Committee on Commerce. Would extend the provisions of the existing fishing vessel construction differential subsidy law (40 U.S.C. 1401-1413) to fisheries which are unable to obtain a finding of injury caused by increased imports; also would increase the limitation on the subsidy paid from 33-1/3 percent on all vessels to 35 percent on wood vessels and 50 percent on metal vessels. Would increase the annual authorization from \$2.5 million to \$12.5 million and extend the date for the last application for subsidy from June 12, 1963, to July 30, 1972. The following identical House bills were introduced: H.R. 12849 (Bates) Aug. 9; H.R. 12927 (McDonald) Aug. 16; H.R. 12960 (Glenn) Aug. 23; and H.R. 12967 (Tollefson) Aug. 23; all referred to the Committee on Merchant and Fisheries.

VESSEL TRANSFER: The House on July 30, 1962, concurred with the Senate amendments to H.R. 3788, to provide for the transfer of the United States vessel Alaska to the Department of Fish and Game of the State of California. The amended bill makes the transfer conditional upon the State of California paying the Federal Government an amount equal to 50 percent of the fair market value of the vessel at the time it was leased by the State of California; it also provides that if the vessel should cease to be used for a public purpose, all right, title, and interest therein shall revert to the United States. The bill was cleared for the President's signature.

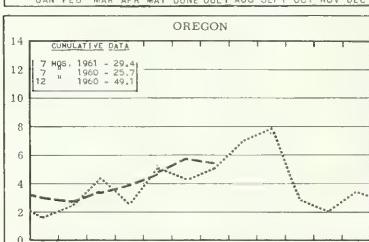
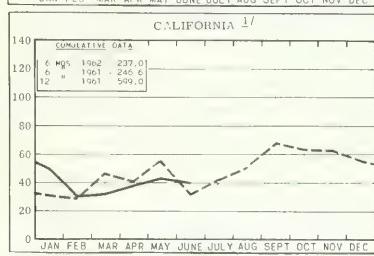
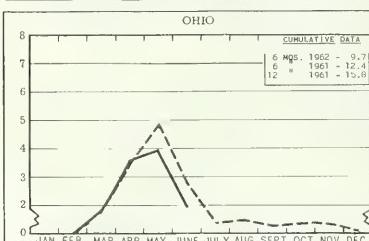
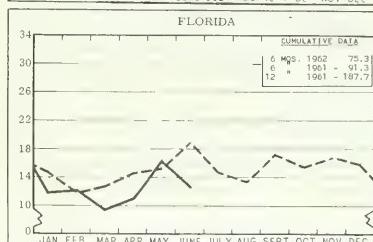
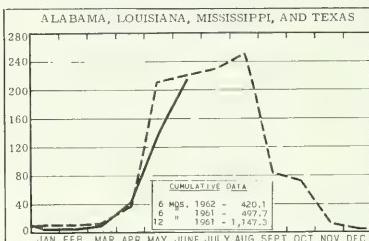
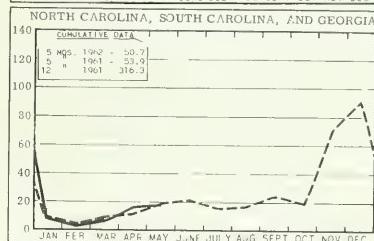
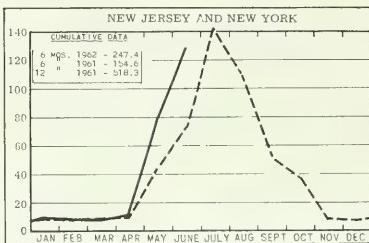
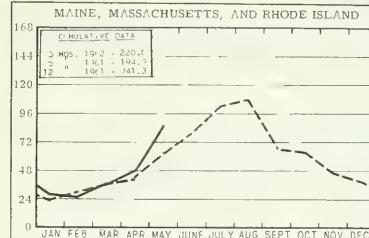
The President on Aug. 9, 1962, signed H.R. 3788 (P. L. 87-576).



FISHERY INDICATORS

CHART I - FISHERY LANDINGS for SELECTED STATES

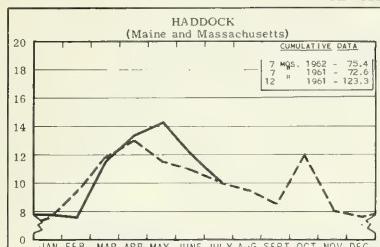
In Millions of Pounds



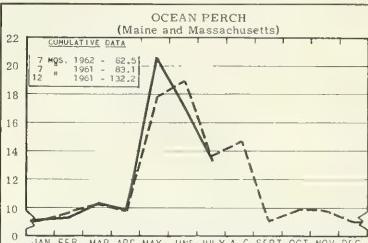
^{1/}ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

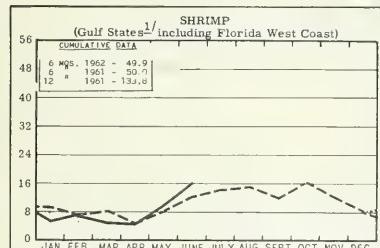
In Millions of Pounds



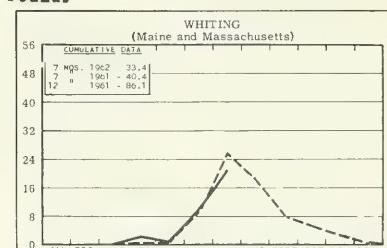
LEGEND:
— 1962
- - 1961



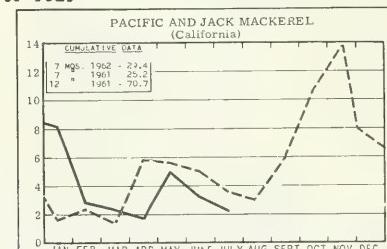
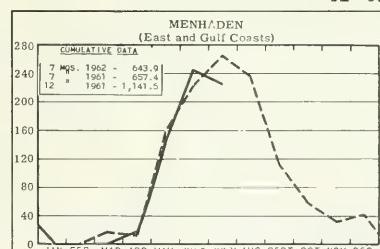
In Millions of Pounds



^{1/}L.A. & A.L.A. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.



In Thousands of Tons



In Thousands of Tons

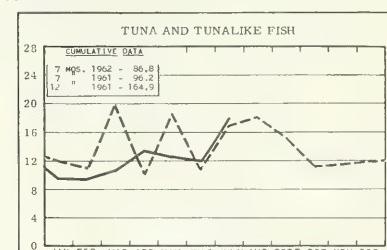
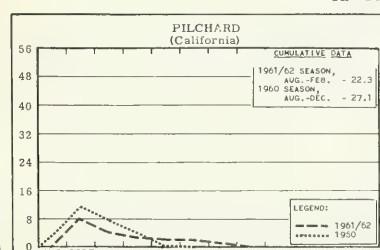
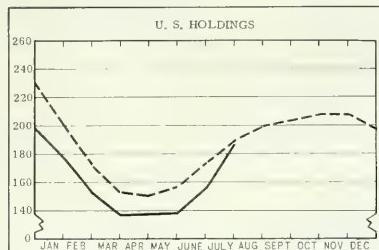
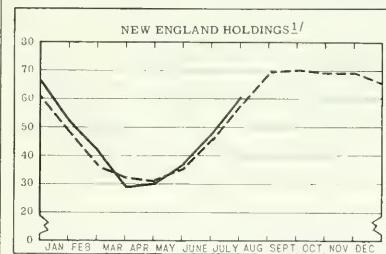
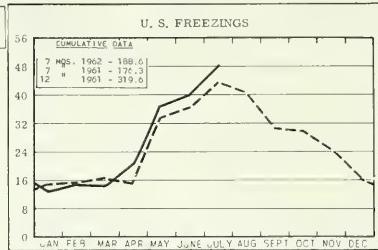


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

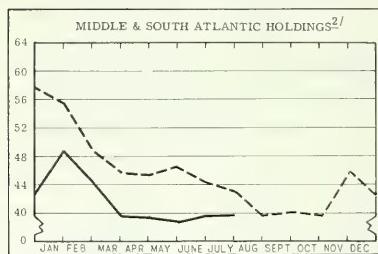
In Millions of Pounds



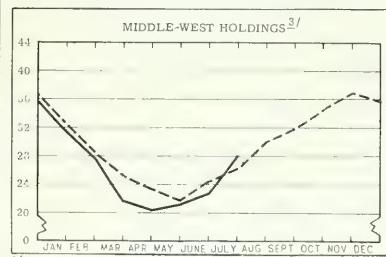
LEGEND:
— 1962
- - - 1961



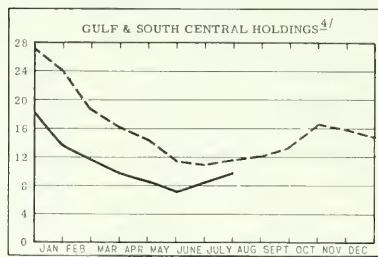
^{1/}MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT



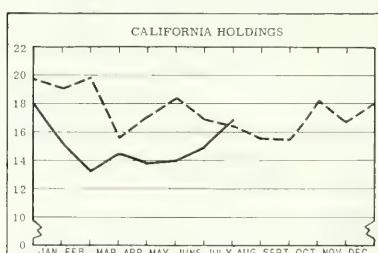
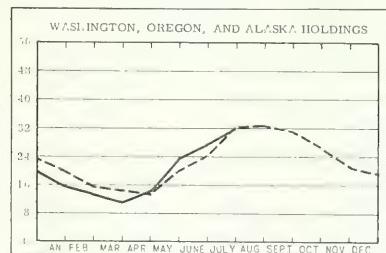
^{2/}ALL EAST COAST STATES FROM N. Y. SOUTH.



^{3/}OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., KANS., NEBR., & KANS.



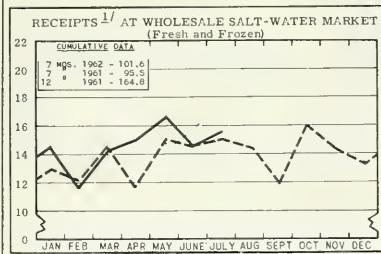
^{4/}ALA., MISS., LA., TEX., ARK., KY., & TENN.



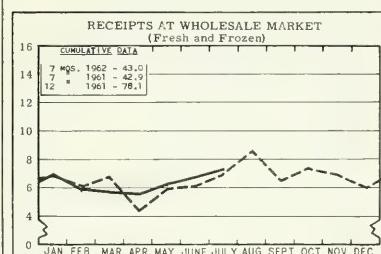
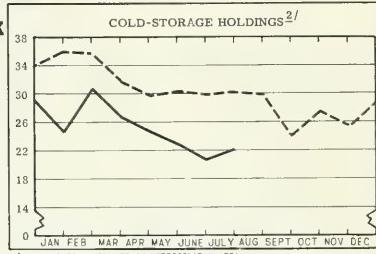
* Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

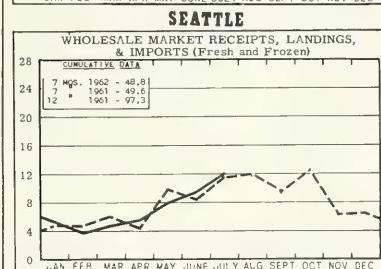
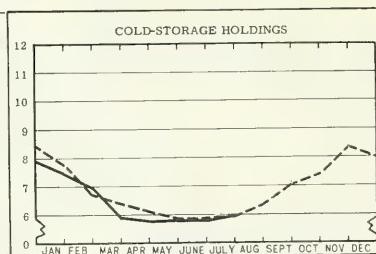
In Millions of Pounds



**NEW YORK
CITY**



CHICAGO



BOSTON

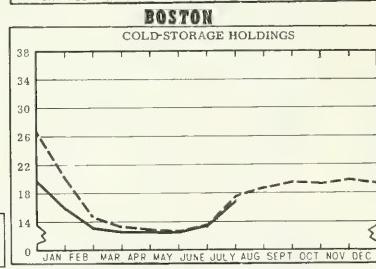


CHART 5 - FISH MEAL and OIL PRODUCTION - U.S. and ALASKA

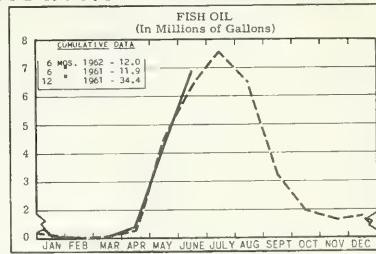
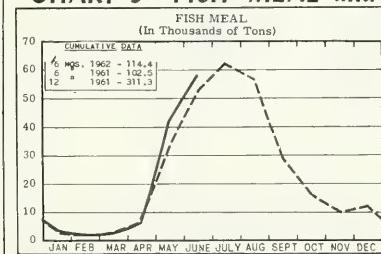
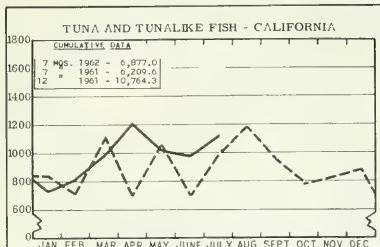
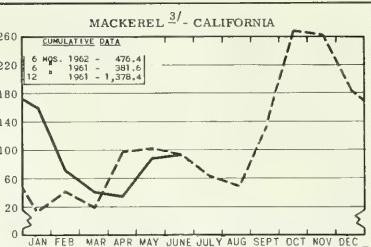


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

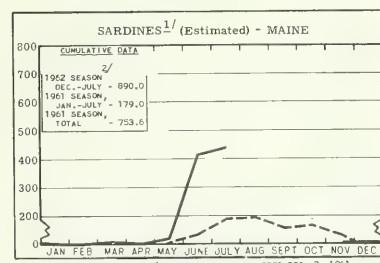
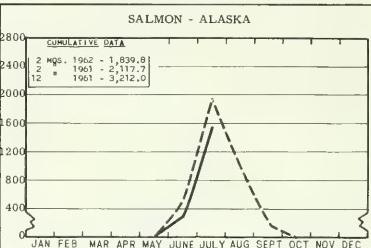
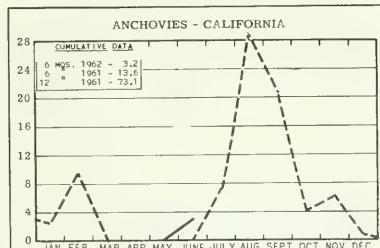
In Thousands of Standard Cases



LEGEND:
— 1962
- - - 1961

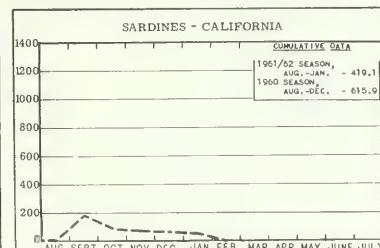


^{3/} INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



^{1/} INCLUDING SEA HERRING. ^{2/} THE 1962 SEASON STARTED DEC. 2, 1961.

STANDARD CASES				
Variety	No. Cans	Designation	Net Wgt.	
SARDINES	100	½ drawn	3 ½ oz.	
SHRIMP	48	--	5 oz.	
TUNA	48	# ½ tuna	6 & 7 oz.	
PILCHARDS	48	# 1 oval	15 oz.	
SALMON	48	1-lb. tall	16 oz.	
ANCHOVIES	48	½-lb.	8 oz.	



LEGEND:
— 1961/62
- - - 1960

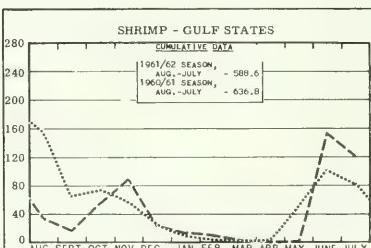
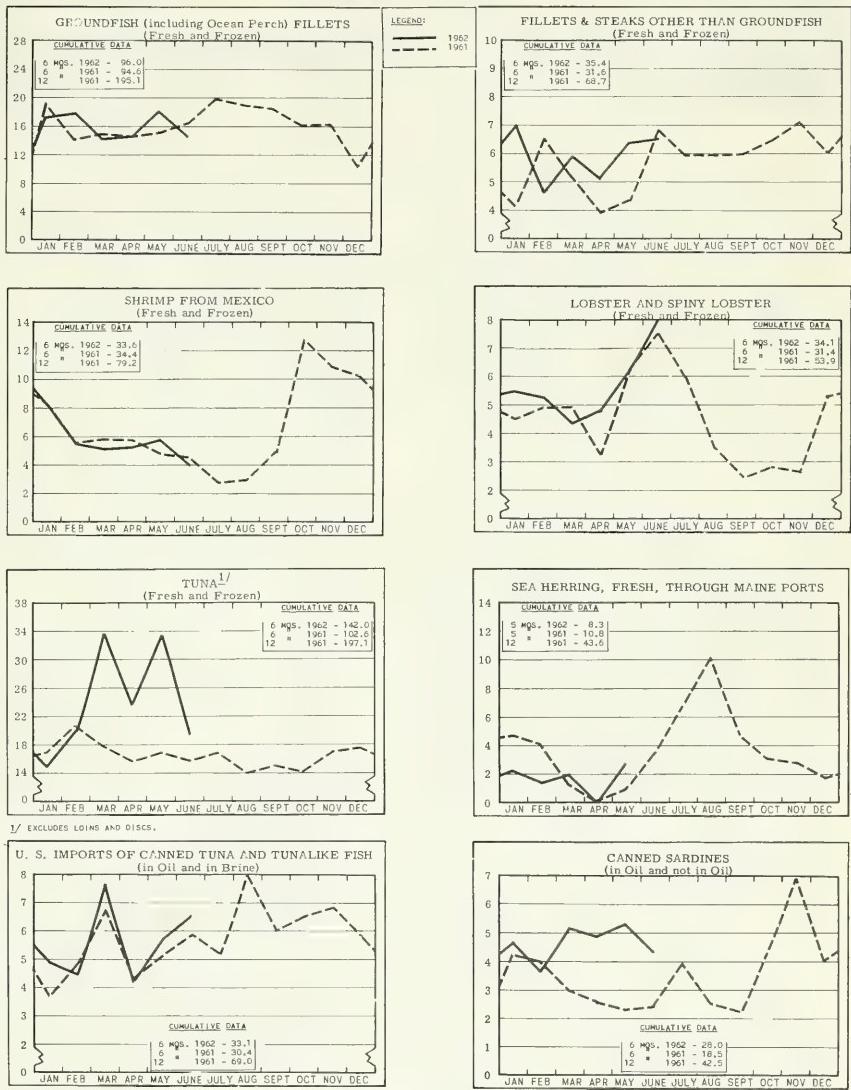


CHART .7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds





RECENT FISHERY PUBLICATIONS

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
 FL - FISHERY LEAFLETS.
 MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
 SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
 SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
 SSR - FISH. - SPECIAL SCIENTIFIC REPORTS - FISHERIES (LIMITED DISTRIBUTION).

Number	Title
CFS-2878	- Massachusetts Landings, 1961 Annual Summary (by Gear and Subarea), 14 pp.
CFS-2906	- Mississippi Landings, 1961 Annual Summary, 5 pp.
CFS-2910	- North Carolina Landings, April 1962, 4 pp.
CFS-2912	- New Jersey Landings, April 1962, 3 pp.
CFS-2914	- California Landings, March 1962, 4 pp.
CFS-2915	- Ohio Landings, March 1962, 2 pp.
CFS-2917	- Maryland Landings, March 1962, 3 pp.
CFS-2918	- Georgia Landings, April 1962, 2 pp.
CFS-2919	- South Carolina Landings, April 1962, 2 pp.
CFS-2920	- Frozen Fish Report, May 1962, 8 pp.
CFS-2922	- Maryland Landings, April 1962, 3 pp.
CFS-2923	- Virginia Landings, April 1962, 3 pp.
CFS-2924	- Rhode Island Landings, March 1962, 3 pp.
CFS-2925	- Louisiana Landings, March 1962, 2 pp.
CFS-2926	- Ohio Landings, April 1962, 2 pp.
CFS-2928	- New York Landings, April 1962, 4 pp.
CFS-2933	- Massachusetts Landings, January 1962, 4 pp.
CFS-2935	- South Carolina Landings, May 1962, 2 pp.
CFS-2941	- Shrimp Landings, January 1962, 6 pp.

FL-57 (Revised February 1962)	- Care of Goldfish, 7 pp.
FL-147 (Revised January 1962)	- List of National Fish Hatcheries, 10 pp.
FL-315 (Revised February 1962)	- Aquarium Construction in the Home Workshop, 7 pp.

FL-481 (Revised February 1962)	- The Use of Aquatic Plants in the Home Aquarium, 4 pp.
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Sep. No. 653	- Aspects of World Trade of Interest to the Fishery Industries.
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Sep. No. 654 - Use of Environmental and Economic Factors to Check Biological Fluctuations in Maine Lobster Population.

Wholesale Dealers in Fishery Products, 1962 (Revised):

SL-1 - Maine, 8 pp.
 SL-2 - New Hampshire, 1 p.
 SL-3 - Massachusetts, 9 pp.
 SL-6 - New York Coastal Area, 10 pp.
 SL-7 - New Jersey, 5 pp.
 SL-8 - Pennsylvania, 3 pp.
 SL-10 - Maryland, 9 pp.
 SL-12 - Virginia, 12 pp.
 SL-13 - North Carolina, 6 pp.
 SL-14 - South Carolina, 3 pp.
 SL-15 - Georgia, 3 pp.
 SL-16 - Florida, 14 pp.
 SL-17 - Alabama, 3 pp.
 SL-19 - Louisiana, 7 pp.
 SL-20 - Texas, 6 pp.
 SL-22 - Oregon, 2 pp.
 SL-27 - Indiana (Great Lakes Area), 1 p.
 SL-29 - Ohio (Great Lakes Area), 3 pp.
 SL-30 - Pennsylvania (Great Lakes Area), 1 p.
 SL-31 - New York (Great Lakes Area), 2 pp.

SL-162 - Farms Producing Fish Sticks and Fish Portions, 1961, 3 pp. (Revised)

SSR-Fish, No. 398 - Distribution of Fish Eggs and Larvae, Temperature, and Salinity in the Georges Bank-Gulf of Maine Area, 1953, by Robert R. Marak and John B. Colton, Jr., 64 pp., illus., November 1961.

SSR-Fish, No. 402 - Variations in the Dissolved Oxygen Content of Intragravel Water in Four Spawning Streams of Southeastern Alaska, by William J. McNeil, 17 pp., illus., processed, February 1962.

Progress in Sport Fishery Research, 1961, Circular 132, 93 pp., illus., processed, 1962. This report of sport fishery research for the calendar year 1961 discusses fish viruses and hepatomas, enzyme systems, amino acid requirements, hematocrits and stamina tests, quality control, estuarine research, hormone stimulation, "fish farming" and "fish control," lake productivity, pesticides, electrofishing, and equilibrium yields—all descendants of the work of earlier years, but new in concept and approach. Also includes a list of publications and special reports issued during the year.

A Report to the Congress on the Federal Aid in Fish Restoration Program for Fiscal Year 1961, 4 pp., processed.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Number Title

MNL-7 - Mexican Fisheries, 1961.

MNL-53 - Fisheries of Honduras, 1961.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, May 1962, 8 pp. (Market News Service, U.S. Fish and Wildlife Service, 103 S. Gay St., Baltimore 2, Md.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, May 1962, 16 pp. (Market News Service, U.S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; Oregon and Washington receipts (domestic and imports) of fresh and frozen tuna and tunalike fish; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, June 1962, 9 pp., illus. (U.S. Bureau of Commercial Fisheries, Biological Laboratory, P.O. Box 6121, Pt. Loma Station, San Diego 6, Calif.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

"Fish Behavior Investigations," by R. Livingstone, Jr., Circular No. 99, pp. 42-43, illus., printed, 1960. (Bureau of Commercial Fisheries, Biological Laboratory, Woods Hole, Mass.)

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, May and June 1962, 8 pp. each. (Market News Service, U.S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf menhaden landings and production of meal, solubles, and oil; and sponge sales; for the months indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, June 1962, 4 pp. (Market News Service, U.S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, May 1962, 21 pp. (Market News Service, U.S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial-fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

Production of Fishery Products in Selected Areas of Virginia, Maryland, and North Carolina, 1961, by William N. Kelly, 22 pp., processed. (Available free from the Market News Service, U.S. Fish and Wildlife Service, 18 South King St., Hampton, Va.) A summary of commercial landings of fish and shellfish and the production of crab meat and shucked oysters as reported by producers and wholesalers in the specific areas mentioned. Catch and production data of fishery products in this report were obtained currently for the selected principal fishing localities of Virginia, Maryland, and North Carolina. The statistics in this summary represent partial commercial fisheries production only and do not represent complete commercial landings or production for a given area, individual state, or the Chesapeake Bay area as a whole. However, the statistics do show trends in fisheries production for the specific area designated and do reflect the over-all production trend by species, localities, and states.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, June 1962, 9 pp. (Market News Service, U.S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle 4, Wash.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl receipts reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; imports from other countries through Washington Customs District; for the month indicated.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

"Aluminum Punch Strip Method for Measuring Fish," article, Progressive Fish-Culturist, vol. 24, no. 2, April 1962, p. 87, illus., processed, 25 cents.

Fishery Statistics of the United States, 1960, by E.A. Power, Statistical Digest No. 53, 531 pp., illus., printed, \$2.75, 1962. The latest in a series of annual statistical reports on the fisheries of the United States contains data on the volume and value of the catch of fishery products, employment in the fisheries, quantity of gear operated, number of fishing craft employed in the capture of fishery products, and information on the volume and value of the

production of manufactured fishery products and by-products. A special feature is a review of the Pacific Coast halibut fishery for the years 1888 to 1960.

The 1960 commercial fisheries of the United States yielded a catch of 4.9 billion pounds valued at \$353.6 million to the fishermen. Only in 1956, when a record 5.3 billion pounds were taken, and in 1959 (5.1 billion pounds) was the annual harvest greater. Compared with 1959, the catch was down 180 million pounds or 4 percent while the value was up over \$7 million or 2 percent. The average price paid to fishermen in 1960 was 7.2 cents per pound--a little higher than in the previous year.

Sharp declines in landings of menhaden, Alaska herring, Pacific sardines, squid, and miscellaneous species used in the manufacture of industrial products resulted in the reduced volume. Increases occurred in catches of Pacific salmon, yellowfin tuna, jack mackerel, crabs, and Maine herring.

Menhaden continued to rank first in volume--a position it had held continuously since 1946. The catch of 2 billion pounds--41 percent of the total U.S. production of all species of fish and shellfish, etc.--was 184 million pounds less than in 1959; however, it was the third largest catch in the history of the fishery.

In 1960, the Pacific Coast tuna fishery recovered from the chaotic conditions of the previous year. Landings totaled 288 million pounds--20 million pounds more than in 1959. Outstanding in the economic recovery of the tuna fishery was the spectacular success of clippers converted to seiners. Tuna seiners were more efficient and economical, taking larger catches in less than one-half the time required by tuna clippers.

Shrimp continued to yield more revenue to U.S. fishermen than any other species. The catch amounted to 249 million pounds, with an ex-vessel value of nearly \$67 million. The volume was up 9 million pounds and the value \$9 million compared with the previous year. Despite increased catches during 1960, the industry was still greatly concerned over the continuing rise in imports which totaled a record 113 million pounds. Primarily through the National Shrimp Congress, the industry continued its effort to have legislation enacted that would provide for an orderly flow of imports.

The 1960 Pacific salmon catch totaled 235 million pounds valued at \$45 million--much better than in 1959 when 202 million pounds valued at \$36 million were landed. However, only in Western and Central Alaska was the season really successful. In some areas, the fishery was nearly a failure.

Red salmon returned to Bristol Bay, Alaska, in near record numbers in 1960. The total run, estimated at well over 35 million fish, yielded a catch of about 13.5 million fish, of which almost 10 million were taken in the Naknek-Kvichak area. Over 20 million fish (perhaps a new record) escaped capture and reached spawning grounds.

Once again, the California sardine season was a failure. The catch dropped from 74 million pounds in 1959 to only 58 million pounds in 1960--the fourth

smallest catch since 1915. There was no lack of interest in fishing, and weather did not limit activities. Sardines just failed to appear in appreciable quantities. High surface water temperatures were believed, at least partially, to be the cause of poor showing of sardines during most of the season.

San Pedro, Calif., was the leading fish landing port in the U.S. in 1960 with respect to both volume and ex-vessel value. Total landings in the San Pedro area, consisting largely of tuna, jack and Pacific mackerel and sardines, amounted to 375 million pounds valued at nearly \$33 million. Pascagoula, Miss., a menhaden port, was in second place with landings of about 302 million pounds, followed by Lewes, Del., with landings of around 282 million pounds, chiefly menhaden. The menhaden ports of Empire and Cameron, La., were next with landings of 216 million pounds and 205 million pounds, respectively. Gloucester, Mass., was in sixth place with landings totaling 192 million pounds, consisting mainly of whiting, ocean perch, and industrial fish. New Bedford, Mass., was in second place with respect to ex-vessel value of landings (over \$13 million), followed by Boston, Mass. (\$9.6 million), and Gloucester, Mass. (\$6 million). The predominance of high-priced sea scallops and flounders in the New Bedford receipts accounted for the high value, although the volume was much less than at other leading ports.

Improving Sport Fishing by Control of Aquatic Weeds, by Eugene W. Surber, Circular 128, 53 pp., illus., processed, 35 cents, 1961. A publication to aid fishery biologists, pond owners, and others who are having problems with aquatic weeds. Large amounts of either submersed or emergent vegetation in fishing waters often interferes with anglers' efficiency, and also leads to overpopulation of stunted fish. The author points out that one of the best ways to control submersed or underwater plants in shallow ponds is to apply fertilizer to the water. The fertilizer encourages the growth of microscopic green or blue-green plants called algae. This free-floating algae, when it becomes dense enough, shades out the larger plants. Many aquatic plants, however, cannot be easily controlled by fertilization, and the algae itself can become a problem. In these cases, chemical control can be effective. A list of aquatic plants and the chemicals that control them is included. Methods of application are discussed and easy-to-follow instructions on measuring the volume of water to determine the rate of application also are included. Various mechanical methods of control are mentioned, including cutting bars and hand-operated weed-cutting saws.

"An Interim Report on Sacramento River Chinook Disease: A Viruslike Disease of Chinook Salmon," by Thomas J. Parisot and John Peinlar, article, Progressive Fish-Culturist, vol. 24, no. 2, April 1962, pp. 51-55, illus., processed, 25 cents.

"Predation of Crayfish on Fishes," by W.L. Minckley and James E. Craddock, article, Progressive Fish-Culturist, vol. 23, no. 3, 1961, pp. 120-123, processed, 25 cents.

"Standards for Reporting Fish Toxicity Tests," by Oliver B. Cope, article, Progressive Fish-Culturist, vol. 23, no. 4, 1961, pp. 187-189, processed, 25 cents.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ALABAMA:

"An Annotated List of Fishes from the Coosa River System of Alabama," by Herbert R. Boschung, Jr., article, *The American Midland Naturalist*, vol. 66, no. 2, 1961, pp. 257-285, printed. *American Midland Naturalist*, Notre Dame, Ind.

ALEWIVES:

"Restoration of Anadromous Alewives at Long Pond, Maine," by Keith A. Hayve, *Transactions of the American Fisheries Society*, vol. 90, no. 3, 1961, pp. 281-286, printed. *Secretary, American Fisheries Society*, P.O. Box 483, McLean, Va.

AMINO ACIDS:

"Studies on the External Mucous Substance of Fishes. III-Identification of Amino Acids in the Mucous Protein from Some Fishes by Paper Chromatography," by Noriyuki Enomoto, Tadaaki Nagao, and Yukio Tomiyama, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 27, no. 2, 1961, pp. 143-146, printed. *Japanese Society of Scientific Fisheries*, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

ANIMAL FEEDING:

"Processed Foods for Dogs and Cats," by W.R. Woolridge, article, *Food Manufacture*, vol. 36, no. 4, pp. 162-163, printed. *Leonard Hill Ltd.*, 9 Eden St., London NW1, England.

ANIMAL NAVIGATION:

"Animal Navigation in the Sea," by Talbot H. Waterman, article, *Gunma Journal of Medical Science*, vol. 8, no. 3, 1961, pp. 243-262, printed. *Gunma University Medical Library*, Maebashi-shi, Japan.

ANTIOXIDANT:

"Applicability of Antioxidant to Marine Products," by K. Toyama, K. Saruya, and K. Ando, article, *Journal of Tokyo University of Fisheries*, vol. 46, no. 1/2, 1960, pp. 107-131, illus., printed. *Tokyo University of Fisheries*, Shiba Kaigandori, 6-Chome, Minato-Ku, Tokyo, Japan.

BARRACUDA:

Tagging of Great Barracuda, *SPHYRAENA BARRACUDA* (Walbaum), by Victor G. Springer and Andrew J. McErlean, Contribution No. 53, 4 pp., illus., printed. (Reprinted from *Transactions of the American Fisheries Society*, vol. 90, no. 4, October 1961, pp. 497-500.) *Florida State Board of Conservation Marine Laboratory*, St. Petersburg, Fla.

BIOCHEMISTRY:

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"Biologicheskii Institut Vengerskoi Akademii Nauk" (The Biological Institute of the Hungarian Academy of Sciences), by S.V. Goryunova and L.K. Osmitskaya, article, *Izvestia Akademii Nauk SSSR Seria Biol.*, vol. 6, 1960, pp. 942-944, printed in Russian. *Akademiia Nauk, SSSR. Seria Biol.*, Moscow, U.S.S.R.

BLACK DRUM:

"Young Black Drum, *Pogonias cromis*, in Tidal Fresh and Brackish Waters, Especially in the Chesapeake and Delaware Bay Areas," by Charles M. Frisbie, article, *Chesapeake Science*, vol. 2, nos. 1-2, 1961, pp. 94-100, printed. *Department of Research and Education, Chesapeake Biological Laboratory*, Solomons, Md.

BONITO:

"Notes on Larvae, Juveniles, and Spawning of Bonito Sarda from the Eastern Pacific Ocean," by W.L. Klawe, article, *Pacific Science*, vol. 15, no. 4, 1961, pp. 487-493, printed. *Pacific Science*, University of Hawaii, Honolulu 14, Hawaii.

BROOK TROUT:

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A Population Study of the Brook Trout, *SALVELINUS FONTINALIS*, by James T. McFadden, *Wildlife Monographs* (Wildlife Society), no. 7, 73 pp., printed. *The Pennsylvania State University*, University Park, Pa.

CANADA:

"A Collection of Oceanic Fishes from off British Columbia with a Discussion of the Evolution of Black Peritonum," by D.E. McAllister, article, *National Museum of Canada Bulletin*, vol. 172, 1960, pp. 39-43, printed. *National Museum of Canada*, Ottawa, Canada.

Fisheries Statistics of Canada, 1960 (Prince Edward Island), 23 pp., illus., printed in French and English, 50 Canadian cents. *Queen's Printer and Controller of Stationery*, Ottawa, Canada, May 1962. Consists of tables giving the quantity and value of the principal species of fish and shellfish landed in Quebec from 1948-60; quantity and value of landings by species and fisheries districts, 1959-60; quantity and value of manufactured fishery products by species, 1959-60; capital equipment employed in the primary fisheries operations, 1959-60; classification of powered fishing craft by over-all length, 1959-60; persons engaged in primary operations by fisheries districts, 1959-60; and persons engaged in the major fisheries, 1959-60.

Journal of the Fisheries Research Board of Canada, vol. 19, no. 3, May 1962, 157 pp., illus., printed. *Queen's Printer and Controller of Stationery*, Ottawa, Canada. Contains among others, the following articles: "The Occurrence of the King Crab, *Paralithodes camtschatica* (Tilesius), and of *Lithodes aequispina* Benedict in British Columbia," by T.H. Butler and Josephine F.L. Hart; "Enumeration of Coliform Bacteria in Light Salted Fish Brines," by H.P. Dussault; "Cod Tagging in the Newfoundland Area during 1947 and 1948," by Wilfred Templeman

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and A.M. Fleming; "On the Fecundity of Pacific Cod (*Gadus macrocephalus* *Tilesius*) from Heceta Strait, British Columbia," by J. Arthur Thomson; and "A Note Concerning the Origin and Quantitative Distribution of Acid-Soluble Phosphorus Compounds and Free Sugars in Fish Muscle," by H.L.A. Tarr and M. Leroux.

Statistics on Salmon Sport Fishing in the Tidal Waters of British Columbia, 1961, 29 pp., illus., processed. Department of Fisheries of Canada, 1155 Robson St., Vancouver 5, B.C., March 31, 1962.

CANNING:

"De bereiding van mossel- en Oestervolconserveren" ("The Packing of Sterilized Mussel and Oyster Products"), by H. Houwing, article, Conservera, vol. 10, no. 2, 1961, pp. 29-31, printed in Dutch. Moerman's Periodieke Pers N.V., Zwarteweg 1, The Hague, Netherlands.

Films About the Canning Industry, 4th edition, 51 pp., illus., printed. National Canner's Assoc., Information Division, 1133 20th St. NW., Washington 6, D.C., June 1962. Contains an alphabetical list of films on the canning industry (including canned fish) along with a brief description of each film. Also includes sponsor of film, cost, and where the films are available.

CATFISH:

"Distinguishing the Catfishes of Pennsylvania," by Keen Buss and Jack Miller, article, Pennsylvania Angler, vol. 31, no. 3, March 1962, pp. 8-9, illus., printed. Pennsylvania Fish Commission, South Office Bldg., Harrisburg, Pa.

CLAMS:

Clam Poison. IV--Studies on the Nitration of Clam Poison and Model Compounds, by R.A.B. Barnard and A.A. Casselman, DRAC Report No. 353, 19 pp., illus., printed, limited distribution. Defense Research Chemical Labs., Canada, July 1961.

COD:

"Lipid Hydrolysis in Frozen Cod Muscle," by E. G. Bligh, article, Journal of the Fisheries Research Board of Canada, vol. 18, 1961, pp. 143-145, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

"Observations on the Ecology of the Pacific Cod, *Gadus macrocephalus*, in Canadian Waters," by K.S. Ketchen, article, Journal of the Fisheries Research Board of Canada, vol. 18, no. 4, 1961, pp. 513-558, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

"Razvitiye Tikhookeanskoi Treski (*Gadus morhua macrocephalus* *Tilesius*)" (Development of the Pacific Ocean Cod *Gadus morhua macrocephalus tilesius*), by V.A. Mukhacheva and O.A. Zvyagina, article, Trudy Instituta Okeanologista Akademii Nauk SSSR, vol. 31, 1960, pp. 145-163, printed in Russian. Izdatel'stvo Akademii Nauk SSSR, Moscow, U.S.S.R.

Synopsis of Biological Data on Cod, GADUS MORHUA Linnaeus, 1758, by John F. Wise, FAO Fisheries Biology Synopsis No. 21, FB/521, SAST-Cod-1, 48 (4), 0,02, 02, 53 pp., illus., processed (limited distribution). Fisheries Division, Biology Branch, Food

and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, December 1961. This is one of a series of synopses of biological data concerning species of aquatic organisms of economic importance. It is a revision of an unpublished life history summary on cod prepared originally for the U.S. National Academy of Sciences Handbook of Biological Data. It discusses the identity of the species, distribution, bionomics and life history, population, and exploitation. Also contains a complete list of references.

CONDUCTIVITY:

"La Mesure en Courant Continu de la Conductivite Electrique des Eaux" (Direct Current Measurement of the Electrical Conductivity of Waters), by J.P. Labrière, article, Vegetatio, vol. 10, no. 1, 1961, pp. 42-52, printed. Vegetatio, Acta geobotanica, Den Haag., Netherlands.

CONSERVATION:

The Conservation of our Natural Resources, Conservation Bulletin 39, 30 pp., illus., printed, 20 cents. U.S. Department of the Interior, Washington, D.C., revised May 1957. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.) Outlines the responsibilities and functions of the Department of the Interior. Describes the Department's conservation program and other activities, and gives a brief historical summary of each Bureau, including the Fish and Wildlife Service, within the Department. Also includes an organization chart, list of Departmental publications, significant dates in its administrative history, and a listing of the Secretaries of the Interior during each Presidential administration.

President Kennedy's Message on Conservation to the Congress of the United States, 20 pp., illus., printed, 20 cents. U.S. Department of the Interior, Washington, D.C., March 1, 1962. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.) Presents a bold and far-seeing message on conservation which President Kennedy sent to Congress on March 1, 1962. Defines the creative relationships between man and the whole spectrum of earth, air, and water resources on which he depends. An unprecedented charter for vigorous action and a specific program for the future. Many kinds of resources, such as energy and metals, forests and forage, soils and water, fisheries and wildlife, are considered here, not only separately, but in that combination which makes up our natural environment.

CRABS:

Pugurid Crabs (DECAPODA ANOMURA) from St. John, Virgin Islands, with Descriptions of Three New Species, by Anthony J. Provenzano, Jr., Contribution No. 329, 15 pp., illus., printed. (Reprinted from Crustaceana, vol. 3, part 2, pp. 151-166.) Marine Laboratory, University of Miami, #1 Rickenbacker Causeway, Miami 49, Fla., 1961.

DIP-TREATED FISH:

"On Chlortetracycline Residue in Dip-Treated Fish," by T. Tomiyama, Y. Yone, and S. Fujino, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 27, no. 7, July 1961, pp. 713-717, illus., printed in Japanese. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

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DOLPHIN:

"Studies on Fishing Conditions of Dolphin, *Coryphaena hippurus* L., in the Western Region of the Sea of Japan. III--On Food Contents of the Dolphin," by Shunpei Kojima, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 27, no. 7, 1961, pp. 625-630, printed. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

ECOLOGY:

Off-Site Ecological Research of the Division of Biology and Medicine--Terrestrial and Freshwater, by Charles L. Dunham and others, TID-13358, printed. U.S. Atomic Energy Commission, Germantown, Md.

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"An Electric Fishing Machine with Pulsatory Direct Current," by A.M.R. Burnet, article, *New Zealand Journal of Science*, vol. 4, no. 1, 1961, pp. 151-161, printed. *New Zealand Journal of Science*, Department of Scientific and Industrial Research, P.O. Box 8018, Government Bldg., Wellington C1, New Zealand.

ELECTRONIC THAWING:

"The Electronic Thawing of Fish," article, *Peche Maritime*, October 1961, pp. 723-727, illus., printed in French. Peche Maritime, 190 Boulevard Haussmann, Paris, France.

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"Photomechanical Changes in the Eyes of Fishes," by J.A. Nicol, article, *Journal of the Marine Biological Association of the United Kingdom*, vol. 41, no. 3, 1961, pp. 695-698, printed. *Marine Biological Association of the United Kingdom*, Cambridge University Press, 200 Euston Rd., London NW1, England.

FISH BEHAVIOR:

"O Povedeni Tikhookeanskoi Treski v Razlichnykh Zoogeographic Regions" (The Behavior of the Pacific Codfish in Various Zoogeographic Regions), by P.A. Moiseev, article, *Zoologicheski Zhurnal*, vol. 39, no. 4, 1960, pp. 558-562, printed in Russian with English summary. Redaktsiya Zoologicheskogo Zhurnala, Podsolenskii per. d. 21, Moscow, B-64, U.S.S.R.

FISH FINDER:

"An Automatic Method of Counting Fish Echoes," by R.B. Mitson, and R.J. Wood, article, *Journal du Conseil*, vol. 26, no. 3, 1961, pp. 281-291, printed. *Conseil Permanent International pour l'Exploration de la Mer*, Charlottenlund Slot, Denmark.

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Fish Flavors, by N.R. Jones, 21 pp., printed. Campbell Soup Co., Camden, N.J., 1961. Paper read at Flavor Chemistry Symposium, Camden. (Also reprinted as *Torry Memoir No. 64*, *Torry Research Station*, Aberdeen, Scotland.)

FISHING NETS:

"Breaking Strength of a Knot of Fishing Net as Affected by the Angle Between Legs of Mesh," by Shunpei Kakuda, article, *Journal of the Faculty of Fisheries and Animal Husbandry, Hiroshima University*, vol. 3, no. 2, December 1961, pp. 231-245, illus., printed.

Faculty of Fisheries and Animal Husbandry, Hiroshima University, Fukuyama, Japan.

FISH LARVAE:

"The Survival of Larval Fish in the Northern North Sea According to the Quality of the Sea Water," by J.H. Fraser, article, *Journal of the Marine Biological Association of the United Kingdom*, vol. 41, no. 2, 1961, pp. 305-312, printed. *Marine Biological Association of the United Kingdom*, Cambridge University Press, 200 Euston Rd., London NW1, England.

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"Other Fish Feedstuffs: Fish Silage, Pulp," article, *1960 Beretning Fiskeriministeriets Forsøkslaboratorium*, p. 48, printed in Danish and English. *Fiskeriministeriets Forsøkslaboratorium*, Copenhagen, Denmark, 1961.

FISH MEASUREMENT:

"A Device for Measuring Larval and Juvenile Fishes," by Robert C. Counts, article, *Copeia*, no. 2, 1961, pp. 224-226, printed. *Copeia*, American Society of Ichthyologists and Herpetologists, 18111 Nordhoff St., Northridge, Calif.

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FISH SCALES:

"Pousiti Zeissova Cteciho Pristroje pro Vyzkum Rybich Supin" (Utilization of the Zeiss Reading Apparatus in Examining Fish Scales), by Milan Penaz and Jiri Libosvarsky, article, *Zoologicki Listy*, vol.

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24, no. 4, 1961, pp. 183-184, printed in Czechoslovakian, Ceskoslovensha Akademie, Ved. Zoologika, Komise, nove mesty, Vodickova 40, Prague 1. Czechoslovakia.

FISH TAGGING:

"Fish Tagging," by Stacy Gebhards, article, Idaho Wildlife Review, vol. 14, no. 6, May-June 1962, pp. 6-7, illus., printed. Idaho Fish and Game Commission, 518 Front St., Boise, Idaho. Gives short background of fish tagging and recovery. Discusses also the common types of fish tags, information provided by tagging studies, and the value of the data for fishery management.

FLORIDA:

Catch and Fishing Effort by Anglers in Florida's Coastal and Offshore Waters, by Albert Rosen and Robert W. Ellis, Special Service Bulletin No. 18, 12 pp., illus., printed. Florida State Board of Conservation, W.V. Knott Bldg., Tallahassee, Fla., November 1961.

Notes on and Additions to the Fish Fauna of the Tampa Bay Area in Florida, by Springer and Woodburn, Contribution No. 52, 3 pp., printed. (Reprinted from Copeia, no. 4, December 19, 1961, pp. 480-482.) Florida State Board of Conservation, Marine Laboratory, St. Petersburg, Fla.

FLOUNDERS:

"Nekotorye Dannye o Raspredelenii Kambalovykh Ryb v Raione Severnykh Kuril'skikh Ostrovov" (Some Data on the Distribution of Flounders in the Region of the Northern Kuril Islands), by M.I. Legeza, article, Trudy Instituta Okeanologii Akademii Nauk, SSSR, vol. 36, 1959, pp. 275-281, printed in Russian. Izdatel'stvo Akademii, Nauk SSSR, Moscow, U.S.S.R.

"A Study of Winter Flounder Movements," by Saul B. Saita, article, Limnology and Oceanography, vol. 6, no. 3, 1961, pp. 292-298, printed. Woods Hole Oceanographic Institution, Woods Hole, Mass.

FOOD:

Fish as Food, vol. 1, edited by Georg Borgstrom, 726 pp., printed, \$24. Academic Press, 111 Fifth Ave., New York 3, N.Y., August 1961. This is the first of three volumes designed to give an up-to-date account of the world's resources of fish, shellfish, and other aquatic organisms suitable for food and feed, their present exploitation and future potentialities. Most of the world's leading fish scientists have contributed to the volumes. Of particular importance is the inclusion of Soviet and Japanese investigations previously unavailable in English. The book is a valuable source of information for all those engaged in the study of marine and fresh-water organisms utilized as food. It also includes valuable and abundant information for the chemist, biologist, bacteriologist, and food technologist concerned with food commodities other than fish. The contents are as follows: Biology of Seafish Production; World Fisheries; Fish Cultivation in Europe; Carp Cultivation in Japan; Raising Fish for Food in Southeast Asia; Organic Constituents of Fish and Other Aquatic Animal Foods; Biochemistry of Fish Oils; Recent Findings in Fatty Acid Composition of Marine Oils; Fish Proteins with Special Reference to Freezing;

The Histamine Problem; Nonprotein Nitrogenous Compounds; Rigor Mortis in Fish; Vitamins in Fish--with Special Reference to Edible Parts; The Microbiology of Sea-Water Fish; Microbiology of Shellfish Deterioration; The Spoilage of Fresh-Water Fish; and Chemical Control of Microbiological Deterioration. Special lists of species mentioned in the text, prepared in a Latin and English arrangement are appended. The contents of vol. II and vol. III are also listed in the present volume.

FOOD CONSUMPTION:

Dietary Evaluation of Food Used in Households in the United States, by Corinne LeBovit and others, Household Food Consumption Survey 1955, Report No. 16, 60 pp., illus., printed, single copy 40 cents, Household Economics Research Division, Agricultural Research Service, U.S. Department of Agriculture, Washington, D.C., November 1961. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.) Fish included in tables only in the basket category of "meat, poultry, fish."

FOOD STORAGE:

Storing Perishable Foods in the Home, Home and Garden Bulletin No. 78, 12 pp., illus., printed, 10 cents. U.S. Department of Agriculture, Washington, D.C., October 1961. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.) This booklet offers specific storage suggestions for foods, including fish. Discusses indication of food spoilage, variations in the degree of temperature and the amount of moisture needed to retain quality in storage, temperatures in the refrigerators, and storage directions for all foods. Fish may be stored in the coldest part of the refrigerator for one or two days. Loose wrappings are suggested as fish benefit from some circulation of air.

FOREIGN TRADE:

"Here are FCIA's Questions, Answers on Foreign Credit Insurance Plan," article, Foreign Commerce, vol. 67, no. 13, March 26, 1962, pp. 496-500, printed. Foreign Credit Insurance Association, 60 John St., New York 38, N.Y. Because of the intense interest on the part of American exporters in the new export credit procedures of the Export-Import Bank's Foreign Credit Insurance Association (FCIA), detailed information prepared by FCIA is reprinted in a question-and-answer form. Included also are samples of FCIA's Short Term-Shipment form.

FRANCE:

"Une Annee de Peche Francaise--Le Rapport sur l'Activite du Comite Central des Peches Maritimes en 1961" (One Year of French Fishing--Report on the Work of the Central Committee of Maritime Fisheries in 1961), and "L'Activite des Comites Interprofessionnels" (Activity of the Interprofessional Committees), by J.S. Parquier, articles, France Peche, vol. 7, no. 62, April 1962, pp. 27-30, 32, 34, 36, 38, 40, 42, 44, 46, 48-49, and vol. 7, no. 63, May 1962, pp. 62, 65-66, 69-70, 73, printed in French. France Peche, Boite Postale 179, Lorient (Morbihan), France.

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of the Final Report Presented by the Commission of Maritime Fisheries of the Fourth Plan), article, France Peche, no. 58, January 1962, pp. 13-14, printed in French, France Peche, Boite Postale 179, Lorient (Morbihan), France.

"La Position des Peches Francaises" (Status of French Fisheries), by Jules Molard, article, France Peche, vol. 7, no. 61, April 1962, pp. 15-16, printed in French, France Peche, Boite Postale 179, Lorient (Morbihan), France.

"Reflexions sur la densite des especes" (Considerations on the Abundance of the Species), by Robert Lenier, article, France Peche, no. 58, January 1962, pp. 17-19, illus., printed in French, France Peche, Boite Postale 179, Lorient (Morbihan), France.

"Une Saison de prospection du Roselys" (A Season of Exploration by the "Roselys"), article, France Peche, no. 58, January 1962, pp. 40-42, illus., printed in French, France Peche, Boite Postale 179, Lorient (Morbihan), France.

"La Situation de l'Industrie de la Conserve du Thon et de la Sardine Avant la Campagne de 1962" (Status of the Tuna and Sardine Canning Industry Before the 1962 Season), by A. de Torquat, article, La Peche Maritime, vol. 41, no. 1010, May 1962, pp. 295-296, illus., printed in French, La Peche Maritime, 190 Boulevard Haussmann, Paris, France.

FREEZE-DRYING:

"Accelerated Freeze-Drying in Fish Processing," by E.A.M. Bradford, article, The Fishing News, vol. 1, no. 1, October 1961, pp. 102, 105-106, illus., printed. The Fishing News, Suite 27, 110 Fleet St., London EC4, England.

"Freeze-Drying Takes First Giant Step," article, Quick Frozen Foods, vol. 23, no. 11, pp. 43-45, illus., printed. E.W. Williams Publications, Inc., 82 Wall St., New York 5, N.Y.

"How Liana Freeze-Dries Shrimp and Plans Full Line of Sublimated Food Products," by K.A. Andersen, article, Canner and Packer, Western Edition, vol. 130, July 1961, pp. 23-24, illus., printed. Tried Publishing Co., 59 East Monroe St., Chicago 3, Ill.

"Prospect for Freeze-Drying," article, Modern Refrigeration, vol. 64, no. 760, July 1961, pp. 690-692, illus., printed. Refrigeration Press Ltd., Maclarens House, 131 Great Suffolk St., London SE1, England.

FREEZING:

"Associated Fisheries' New Trawler Can Freeze Half Her Catch at Sea," article, Frozen Foods, vol. 14, no. 7, July 1961, pp. 476-477, illus., printed. Maclarens House, 131 Great Suffolk St., London SE1, England.

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Bericht über Stellung und Lage der Seefischerei der Bundesrepublik Deutschland (Report on the Position and Status of Marine Fisheries of the Federal Republic of Germany), Deutscher Bundestag--4, Wahlperiode, Drucksache IV/230, 35 pp., illus., printed in German. Der Bundesminister für Ernährung, Landwirtschaft und Forsten, Bonn, Germany, February 28, 1962. Reviews the status of the West German fishing industry and proposes a considerable increase in government aid in the form of subsidies and loans.

GILL NETS:

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A.H. Berst, article, *Transactions of the American Fisheries Society*, vol. 90, no. 4, 1961, pp. 413-418, printed. Secretary, American Fisheries Society, P.O. Box 483, McLean, Va.

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United States Imports of Merchandise for Consumption (Commodity by Country of Origin), Calendar Year 1961, Report No. FT 110, 204 pp., illus., processed, \$1. Bureau of the Census, U.S. Department of Commerce, Washington, D.C., May 1962. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.) The import statistics include government as well as nongovernmental shipments of merchandise (including fish, shellfish, and fishery byproducts) from foreign countries.

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"Zur Problematik der Strahlenkonservierung von Lebensmitteln" (Preservation of Foodstuffs by Means of Irradiation), by J. Kuprianoff, article, *Atomkernenergie*, vol. 4, 1959, pp. 296-299, printed in German. Karl Thiemic KG, Pilgersheimer Strasse 38, Munich 9, Germany.

"The Revised U.S. Army Quartermaster Corps Program on Food Preservation by Ionizing Energy," by William B. Levin, article, *Food Irradiation, Quarterly International Newsletter*, vol. 2, no. 2, October-December 1961, pp. A6-A9, printed. O.E.E.C. Mission, Publications Office, Suite 1223, 1346 Connecticut Ave., NW, Washington 6, D.C.

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Rules of the Road, Great Lakes, CG-172, 66 pp., printed. U.S. Coast Guard, Treasury Department, Washington 25, D.C., May 1, 1959. Contains navigation requirements which must be followed by vessels navigating upon the Great Lakes and their connecting and tributary waters. Related laws and regulations affecting navigation on the Great Lakes under the cognizance of the Coast Guard, as well as certain pertinent general regulations of the Corps of Engineers, Department of the Army, are also included.

Rules of the Road, International-Inland, CG-169, 93 pp., printed. U.S. Coast Guard, Treasury Department, Washington 25, D.C., May 1, 1959. Contains the amended international Regulations for Preventing Collision at Sea, 1948, which are to be followed by all public and private vessels and seaplanes of the United States while navigating upon the high seas and the rules to prevent collisions to be followed by all vessels while navigating upon certain inland waters of the United States. Related laws and regulations affecting navigation in coastal inland waters under the cognizance of the Coast Guard are also included.

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Evaluation of Commercial Fishing by Use of a Questionnaire, by Louis H. Carufel, 4 pp., illus., printed.

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Common Seashore Life of the Pacific Northwest, by Lynwood Smith, 66 pp., illus., printed, \$3.25; paper, \$1.75. Naturegraph Co. and Naturegames Publishers, 8339 W. Dry Creek Rd., Healdsburg, Calif. Guide to common and conspicuous beach life; describes habits and characteristics.

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Storage and Transport of Fish in Refrigerated Sea Water, by S.W. Roach, J.S.M. Harrison, and H.L.A. Tarr, Bulletin No. 126, 68 pp., illus., printed, 75 cents. Fisheries Research Board of Canada, Ottawa, Canada, 1961. (Available from Queen's Printer and Controller of Stationery, Ottawa, Canada.) Describes the refrigerated sea-water method of holding chilled fish. Discusses the engineering aspects of freezing fish; the refrigeration theory; structural require-

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ments and materials used in tanks, condensers, evaporators, pumps, and piping; practical application of the method in different fisheries; physical and chemical changes in fish in ice water; bacteriological spoilage and its control. Also includes two illustrated appendices entitled "Experiments on the Storage of Canadian Atlantic Coast Cod in Refrigerated Sea Water," by W.A. MacCallum and M.S. Chan; and "Chilled Water for the Preservation of Freshwater Fish," by A. W. Lantz.

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NATIONAL FISH 'n SEAFOOD PARADE--OCTOBER 1962

In order to encourage the greater use of fish and shellfish products, this year's Fish 'n Seafood Parade will extend throughout the month of October. This is the Fishing Industry's eighth annual all-out promotion. Extensive advertising over radio, television, newspapers, and national magazines will point out to the consumer that fishery products are healthful and good eating. Three thousand food store executives have been alerted to the campaign. Because of the importance of lemons in the serving of seafoods, the promotion is being actively supported by the Sunkist Growers of California.

National and local publicity will concentrate on consumers, restaurants, and institutions. At the retail level, a poster 38" x 25" will feature the "sailor or boy on the fish"--the image which identifies the Annual Fish 'n Seafood Parade.

A new feature of the promotion is the Seafood Plate Contest for the huge institutional food service industry. The contest will create new interest in fishery products and give chefs an opportunity to show their skill--and win a prize. The contest, which



runs from September 1 through October 31, has attracted special support and will be nationally advertised by fishery associations. Contest information is even being packed and distributed with institutional fish packs. Additional prizes are being offered by several firms. The contest will cover three categories: (1) pre-cut fish portions; (2) fillets, steaks, and other fish; and (3) shellfish. As its contribution to "Fish 'n Seafood Parade," the U.S. Bureau of Commercial Fisheries nationally distributed consumer educational materials to newspaper editors and other food publicists, public and private schools participating in the National School Lunch Program, restaurants, public and private institutions, in-plant feeders, and the retail food trade. Black and white food photographs were supplied to newspaper food

columnists. In addition, the Bureau contacted radio stations throughout the country to request the use of the Bureau's new public service spot announcements and the continued use of previous recorded announcements. Bureau home economists and marketing specialist made personal appearances on radio and television food shows throughout the country.

Past experience shows that each new Parade is more effective than the last. The 1962 promotion is on its way to be the best ever.



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COMMERCIAL FISHERIES REVIEW



VOL. 24, NO. 10

OCTOBER 1962

FISH and WILDLIFE SERVICE
United States Department of the Interior
Washington, D.C.



COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor

Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

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Use of funds for printing this publication has been approved by the Director of the Bureau of the Budget, May 10, 1960.

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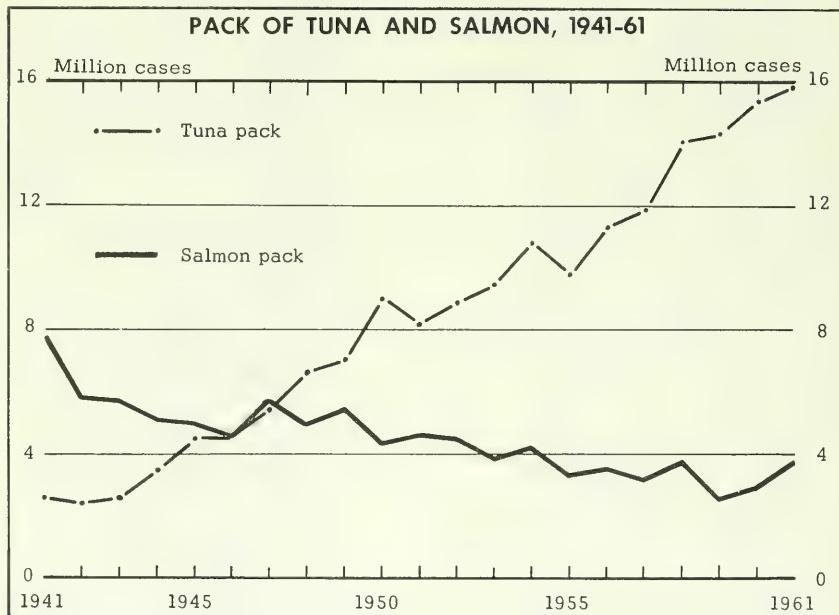
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CANNED FISHERY PRODUCTS - 1961

C. F. S. No. 2862, Canned Fishery Products - 1961 (An Annual Summary), shows that the pack of canned fishery products in the United States, American Samoa, and Puerto Rico during 1961 amounted to 33 million standard cases (1 billion pounds), valued at \$424 million to the packers. Compared with 1960, this was a 4-percent decrease in production but an increase of 9 percent in value.



The 1961 pack for human consumption was 48 million pounds and \$41 million higher than in 1960. The gain in both quantity and value was due largely to record packs of tuna and crab meat, and to increased production of canned salmon, mackerel, and oysters. The value of two products--canned salmon and tuna--accounted for 72 percent of the total revenue received by packers of canned fishery products.

The packs of Maine and Pacific sardines, shrimp, and animal food were less than in the previous year.

Copies of C. F. S. No. 2862 are available free from the Office of Information, U. S. Fish and Wildlife Service, Washington 25, D. C.

COMMERCIAL FISHERIES REVIEW

October 1962

Washington 25, D. C.

Vol. 24, No. 10

A METHOD OF PREDICTING FLUCTUATIONS IN THE SEA SCALLOP POPULATIONS OF MAINE

By Robert L. Dow*

DISTRIBUTION OF THE RESOURCE

The sea scallop (*Placopecten magellanicus*) resource of the State of Maine consists of relatively distinct populations occupying the bottom of estuaries and embayments from the Piscataqua River, separating Maine and New Hampshire, eastward to the St. Croix River which forms the international boundary with the Province of New Brunswick. Vertical distribution ranges from mean low water in some areas to depths of several hundred feet in others.

Concentrations of commercial importance are limited to the area from Penobscot Bay eastward. The most extensive populations are those of Penobscot Bay to Mt. Desert Island. In recent years landings from that area have ranged from 40 to 90 percent of the total inshore catch. Sporadic and generally non-commercial dragging has been carried on in Casco Bay, Sheepscot Bay, and the lower Damariscotta River.

THE FISHERY

The fishery appears to have had its beginning about 1880 but records of landings are extant only since 1887 and then with several gaps, principally in the 1890's and between the end of World War I and the 1930's. Consecutive annual landings data are limited to the period since 1938.



Fig. 1 - A Penobscot Bay scallop being attacked by two starfish.

The open season from November 1 through the following March 31 has been inspired by two considerations: (1) the low-water temperatures of the winter make the scallops less active and, therefore, less able to escape the small inefficient drags used in the fishery, and (2) it provides off-season employment for those fishermen who normally are engaged in other fishing activities during the remainder of the year. Since the catch is reported by calendar year, each year's landings include portions of two fishing seasons.

Sampling of the catch from 1949 to 1953 and in 1957-58 indicated that toward the end of each fishing season (January-March) an increasing number of scallops that have completed their sixth growing season enter the fishery. By that time the population of older and larger scallops has been so reduced by fishing that fishermen depend upon the new crop for a con-

*Research Directory, Maine Department of Sea and Shore Fisheries, Augusta, Maine.

tinuing source of supply. This year-class is fished twice during the calendar year. The January-March catch represents some 12 to 15 percent of the landings for the year. Following the seventh growing season the same year-class adds another 13 to 25 percent to the year's catch; the total contribution varying with the relative importance of the year-class to the available population. Landed value for the shucked meats which has ranged from 6 cents in 1887 to 61 cents in 1952, with a median of 25 cents per pound, has continuously attracted intensive commercial activity.

LANDINGS AND ABUNDANCE

The consistency with which periodic highs have alternated with lows in landings at approximately decade intervals suggests, with what is known of the fishery, that scallop abundance has likewise fluctuated in the inshore growing areas of Maine.

Table 1 - Maine Scallop Landings^{1/}, Selected Years 1889-1960

Year	Weight of Meats 1,000 Lbs.		
1889	295		
1899	53		
1910	2,027		
1919	73		
1933	1,073		
1944	101		
1950	512		
1960	72		

^{1/} Shown are only landings from Maine "inshore waters." Not included are Maine landings from offshore waters or Georges Bank in those years when Maine vessels did fish those waters.

This assumption has been supported by the biological sampling of M. A. Chrysler (1920) in 1917, and of the Department of Sea and Shore Fisheries from 1949 to 1953 and in 1957-58 which forecasted the general trends landings were to take during immediately subsequent years.

SEA WATER TEMPERATURE

The only data which indicate why these fluctuations have taken place are records of sea water temperature taken at Boothbay Harbor by the U. S. Fish and Wildlife Service or its predecessor agencies since March 1905.

Since the offspring of any year's spawning--August to October--becomes of major importance to the fishery six years later, it appears from a study of temperature and production records that an association exists between sea water temperature six years earlier and highs and lows of scallop landings.

The values in table 2 suggest an optimum temperature of 46.⁰⁰ F. to 46.⁵⁰ F. for peak landings. Less favorable high and low temperatures yield the lowest landings.



Fig. 2 - A typical Penobscot Bay scallop dragger.

Table 2 - Relationship Between Sea Water Temperatures Six Years Earlier and Highs and Lows in Maine's Scallop Landings

Sea Water Temperature	Scallop Landings (Meats Only)
Year	1,000 Lbs.
1913	47.4
1927	46.2
1938	45.1
1944	46.5
1954	50.2
1919	73
1933	1,073
1944	101
1950	512
1960	72



Fig. 3 - Tagging scallops for growth, mortality, and migration studies.



Fig. 4 - Bryozoan attached to adult scallop shell. Juvenile scallops in turn attached to Bryozoan.

Scallop landings for consecutive years are available only since 1938. The 24 years since 1938 were grouped by the amount of landings. Monthly mean sea water temperatures six years before were averaged for the corresponding years of landings. It was observed that years of low landings were preceded by extremely high or extremely low mean sea water temperatures. Therefore low landings were grouped according to the mean temperature six years previously.

Table 3 - Mean of Monthly Sea Water Temperatures ($^{\circ}\text{F}.$) at Boothbay Harbor and Mean Annual Scallop Landings Six Years Later

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual Mean	Mean Scallop Landings (Meats) 6 Yrs. Later	Number of Years
33	31	33	37	46	53	59	60	56	49	42	37	45	120	4
35	34	35	40	48	55	60	61	57	50	45	38	46	500	8
37	35	37	42	48	56	62	63	59	53	48	43	49	250	8
41	40	41	45	51	57	62	62	60	55	50	45	51	105	4

The data summarized in table 3 suggest that seasonal temperatures are more closely related to subsequent yield than are annual means. October-November temperatures appear to be representative of the critical August-December spawning and post-spawning period. March-April temperatures representative of the winter-spring period appear to be equally important to the association between temperature and relative scallop abundance. This association is shown in table 4.

Table 4 - Seasonal Associations Between Temperature and Landings in Maine

Temperature Years	Mean of March-April and October-November Sea Water Temperature in $^{\circ}\text{F}.$ at Boothbay Harbor	Sea Scallop Landings (Meats Only)		
		Six Years Later	Range of Landings	Scallop Landings Years
1938, 1939	39.9	103	101-105	1944, 1945
1936, 1940, 1948	41.4	137	131-144	1942, 1946, 1954
1934, 1942	41.6	455	454-456	1940, 1948
1941, 1943, 1944	42.6	509	507-512	1947, 1949, 1950
1932	43.3	793	-	1938
1933, 1945	43.4	387	378-395	1939, 1951
1935, 1946, 1950	44.4	319	314-327	1941, 1952, 1956
1937, 1951	45.8	236	219-243	1943, 1957
1947, 1949	46.2	231	-	1953, 1955
1952, 1953, 1955	47.4	123	108-138	1958, 1959, 1961
1954	48.0	72	-	1960

SUMMARY

During the past 80 years the inshore sea scallop fishery in Maine has alternated at about decade intervals between extremes of high and low landings. The financial attractiveness of the resource during the winter when other species are less available, the comparatively restricted area occupied by scallops, and biological sampling of the population support the assumption that yield is an acceptably reliable index of relative abundance. Trends of sea water temperature closely parallel declines and increases in the relative abundance of sea scallops as indicated by landings and suggest an optimum range as well as unfavorable high and low temperatures.



Fig. 5 - Juvenile scallops attached by byssus to adult scallop. Smaller juvenile (4.5 mm.) is smallest found so attached. Juveniles slightly smaller than this were found attached only to Bryozoa or hydroids. Larger juvenile (9.6 mm.) is approximately largest found attached to scallop shell.

3. If the long-range sea water temperature trend recorded since 1905 continues, it may be anticipated that average annual long-term sea scallop landings from Maine waters will continue to decline. It may be further anticipated that annual scallop landings will average approximately 100,000 pounds by 1980.

4. On the basis of 1956-1961 sea water temperature at Boothbay Harbor, predictions with respect to the probable yield of the Maine inshore sea scallop fishery are shown for the period 1962-1967 in table 5.

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ACCURACY OF NET-WEIGHT DETERMINATIONS FOR FROZEN GLAZED HALIBUT STEAKS

By Max Patashnik*

ABSTRACT

A check was made on the accuracy of the net-weight determination for frozen glazed halibut steaks as ascertained by the method given in the current U. S. Standards for Grades of Frozen Halibut Steaks; and the possibility of simplifying the method was investigated.

INTRODUCTION

Accurate methods of evaluating quality are essential in developing and applying U. S. Standards for grades of fishery products. Periodically, official methods used in these standards are retested for accuracy and possible improvement. Inquiries into the accuracy of the method for determining net weight of frozen glazed halibut steaks were recently received at the Seattle Technological Laboratory. This method (based on the deglazing of frozen steaks according to the procedure given in the current U. S. Standards for Grades of Frozen Halibut Steaks, March 1959) was accordingly reevaluated.

In preparing frozen halibut steaks, the processor usually cuts them from frozen, dressed, glazed whole halibut and glazes the individual steaks with ice by dipping them briefly in cold water. The glaze, which serves as a protection against dehydration during subsequent storage and distribution, consists of a surface covering of ice that varies in thickness and may or may not have chemical additives incorporated in it. In setting the fill weight of the package (net weight plus glaze weight), the processor makes an allowance for the weight of the glaze (pre-existing skin glaze plus added surface glaze) in order to conform to the declaration of net weight on the label. The inspector, in applying the Federal grade standard, must check the net weight in order to determine compliance.

The objectives of the present study therefore were (1) to check the accuracy of the net-weight determination for frozen glazed halibut steaks, using the official percentage-glaze method, and (2) to consider the possibility of simplifying the method.

CHECK ON ACCURACY

DESCRIPTION OF OFFICIAL METHOD: The method, as published in the U. S. Standards for Grades of Frozen Halibut Steaks, consists essentially of the following steps:

- (1) Weigh the steaks with the glaze intact, which gives C, the gross weight.
- (2) Thaw the glaze from the surfaces of the steak with flowing tap water.
- (3) Wipe off the excess water from the surface with a single paper towel.
- (4) Weigh the deglazed steaks, which gives D, the net weight.
- (5) Calculate the percentage glaze as $\frac{C-D}{D} \times 100$.

EXPERIMENTAL: To test the accuracy of the method, we prepared glaze-free frozen halibut steaks of known weight and glazed them. The glaze was then thawed off and the steaks were reweighed. The difference in weight was considered to be the error in the method.

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Details of the procedure were as follows: Unglazed frozen dressed halibut were cut by bandsaw into steaks of varying size, scraped clean of sawdust, and weighed immediately, which gave the true net weight, T. The frozen steaks were then ice-glazed by being dipped into cold fresh water. From 2- to 12-percent glaze by weight of the individual steak was added, and the steaks were stored at 0° F. until tested. In a series of tests at intervals of time the glazed steaks were deglazed and weighed (actual net weight, D) according to the official method. This work was done by four analysts, using steaks that varied in size and in percentage of glaze.

The percentage error in the determination of true net weight was calculated as follows:

$$\frac{(\text{actual net weight} - \text{true net weight}) \times 100}{\text{true net weight}} = \frac{(D - T) \times 100}{T}$$

RESULTS AND DISCUSSION: The data are shown in tables 1 and 2. Table 1 lists the average percentage error for series A, B, and C. Table 2 lists the range of the maximum and minimum individual values for experimental series A, which gives an indication of the variability of individual values.

Table 1 - Average Percentage Error in the Determination of True Net Weight

Series	Experiment	Total Steaks	Range in Steak Weights	Range in Amount of Glaze	Average Error in True Net Weight as Found by Analyst:			
					A	B	C	D
A	No.	No.	Grams	Percent	Percent	Percent	Percent	Percent
	1	50	177-286	2.1-12.5	-0.2	-0.1	-0.1	-
	2	50	175-283	2.0- 5.8	+0.4	+0.2	+0.3	-
	3	50	91-343	4.5- 7.8	0.0	-0.2	-	-
B	4	1/38	86-225	4.1- 7.5	-0.2	+0.1	-	-
	5(a)	9	102-168		-	-	-	+0.9
	(b)	16	82-157		-	-	-0.6	-
	6(a)	32	160-371		-	-	-	+0.7
	(b)	19	200-339	2.9- 9.9	-	-	0.0	-
	7	29	108-226		-	-	+0.2	-
	8	52	107-228		-	-	-	+0.1
	9	50	97-239		-	-	+0.2	-
	10(a)	9	2/125-284	glaze free	-	-	+0.2	-
C	(b)	9	3/125-284	"	-	-	-0.3	-
	(c)	9	4/125-284	"	-	-	-0.4	-

1/In experiment 4, analyst A tested 6 steaks; analyst B, 32 steaks; the steaks were equally divided in experiments 1, 2, and 3.

2/These glaze-free samples were stored for 4 months at 0° F. in polyethylene bags till slightly dehydrated. They were deglazed in accordance with the standard procedure.

3/Each steak from experiment 10(a) was given seven successive 10-second thawing exposures to 50° F. running water at 1-minute intervals until they were almost completely thawed. They were then weighed after removal of excess surface water.

4/Each steak from experiment 10(b) was frozen overnight, and the procedure for 10(b) was repeated.

Series A: In this first series of tests on 188 steaks by three analysts, the average values ranged from +0.4 to -0.2 percent of true net weight. All the individual values (table 2) were within the range of +1.3 to -1.3 percent of the true net weight, and 95 percent of the individual values were within the range of +1.0 to -0.9 percent of the true net weight.

Table 2 - Range of Individual Values for Percentage Error in the Determination of True Net Weight

Series	Experiment	Total Steaks	Range of Error in True Net Weight		Remarks
			All Individual Values Are Within:	95% of Individual Values Are Within:	
A	No.	No.	Percent	Percent	Data obtained by 3 experienced analysts.
	1	50	-1.3 to +0.7	-0.9 to +0.5	
	2	50	-0.7 to +1.3	-0.4 to +1.0	
	3	50	-0.8 to +0.5	-0.6 to +0.5	Data obtained by 2 experienced analysts.
	4	38	-1.0 to +0.4	-0.6 to +0.5	

Series B: In this second series of tests (2 years later) on 207 steaks by two analysts without trial practice, the average values ranged from -0.6 to +0.9 percent from true net weight. With further practice, the analysts improved their techniques, and the average differences from true net weight were 0.2 percent or less for the last four experiments in this series.

Series C: In the third series of tests (4 months after series B) on a lot of nine unglazed steaks stored for 4 months at 0° F. to observe the effect of slight dehydration (simulated short retail storage), an experienced analyst obtained an average value of +0.2 percent of true net weight. To observe the effect of excessive thawing, we subjected these same steaks to seven successive 10-second exposures to running water (50° F.) at 1-minute intervals until they were almost completely thawed. The average error in true net weight was -0.3 percent. The same steaks were frozen overnight and again given seven successive 10-second exposures to running water. The average error in true net weight was now found to be -0.4 percent. Thus, slight dehydration of the sample or overthawing of the sample do not introduce serious errors in the method under test.

POSSIBILITY OF SIMPLIFYING THE METHOD

Various steps in the procedure were examined for possible improvement or simplification.

FLOW RATE AND TEMPERATURE OF DEGLAZING WATER: In the removal of the glaze from halibut steaks, the official method specifies a rate of flow of 3 quarts per minute and the use of tap water at 50° to 60° F.

Variations in temperature and in rate of flow of the water had no significant effects, indicating that strict adherence to this part of the procedure is not necessary.

DEGREE OF DEGLAZING AND WIPING OFF OF EXCESS WATER: The official method specifies that deglazing be continued until "all glaze is removed from cut flesh surface, as evidenced by absence of slick feel to finger," and that the analyst should "rapidly remove excess water with single paper towel."

Slight to moderate overthawing of the steak surface during deglazing had no significant effect, provided that the excess water was gently wiped off with a single paper towel. It should be remembered in carrying out this step that the surface of the thawed steak is like a wet sponge. Vigorously blotting each steak with a new dry towel will remove fluid from the meat, thereby giving a smaller actual net weight.

The following two alternative modifications in the method of removing excess water from the March 1959 published method were tested:

(a) Gently wipe off the excess water with a single paper towel that is saturated with moisture. (Use of the moisture-saturated towel avoids the possible blotting action of a dry towel.)

(b) Shake off the excess water. In this step, hold the steak lightly and then vigorously shake it 6 times through a 1-foot arc. (In using this modification, slightly overthaw the steak surface rather than underthaw it.)

The two alternative methods gave equivalent results, though the shaking method was slightly faster and simpler. The difference, however, was not sufficient to justify a recommendation of one over the other.

CONCLUSIONS

(1) In a test of the official method for determining the average net weight of frozen glazed halibut steaks, results were within ± 1.0 percent of the true net weight.

(2) Variation in temperature and rate of flow of thawing water for removing glaze in the official method and moderate overthawing of the steak surface had no significant effects, indicating that strict adherence to this part of the procedure is not necessary.

Careful removal of excess water from the surface of the deglazed steak was the key operation. To obtain best results, the analyst should gently remove surface water, either by

use of a moisture-saturated paper towel, avoiding vigorous blotting with a dry paper towel, or by holding the partly thawed steak lightly and shaking it six times through a 1-foot arc.

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VARY YOUR MENUS BY SERVING DEVILED CLAMS

Many traditions in the United States have grown up around the serving and eating of clams. Annual clam eating contests are held in various coastal regions of the country. The connotations of the term "Clambake" have extended the use of that word far beyond its original meaning. Few controversies, in cooking circles at least, have more participants than that which centers on the proper way to prepare clams.



omists of the Bureau of Commercial Fisheries, United States Department of the Interior, recommend serving is "Deviled Clams".

DEVILED CLAMS

1 pint clams or 2 cans (7 ounces each) clams	$\frac{1}{4}$ teaspoon thyme
$\frac{1}{2}$ cup chopped celery	3 drops tabasco
2 tablespoons chopped onion	1 tablespoon chili sauce
$\frac{1}{2}$ clove garlic, finely chopped	1 egg, beaten
$\frac{1}{4}$ cup butter or other fat, melted	$\frac{1}{2}$ cup cracker meal
1 tablespoon flour	2 tablespoons chopped parsley
$\frac{3}{4}$ teaspoon salt	2 tablespoons butter or other fat, melted
$\frac{1}{4}$ teaspoon pepper	$\frac{1}{2}$ cup dry bread crumbs

Drain clams. Chop. Cook celery, onion, and garlic in butter until tender. Blend in flour and seasonings. Add clams and cook until thick, stirring constantly. Stir a little of the hot sauce into egg, add to remaining sauce, stirring constantly. Add meal and parsley. Place in 6 well-greased individual shells or casseroles. Combine butter and crumbs. Sprinkle over top of deviled clams. Bake in a hot oven, 400° F., for 10 minutes or until brown. Serves 6.

TRENDS AND DEVELOPMENTS

California

SPINY LOBSTER REGULATIONS AND SHRIMP TRAWLING QUOTAS CHANGED:

New rules adopted for the California spiny lobster fishery by the California Fish and Game Commission prohibit the pulling of traps at night and require uniform-size permit numbers on trap buoys.

Shrimp trawling quotas were changed in two areas by the Commission. The quota in the area off California between the Oregon border and False Cape, Calif., was raised from 1,250,000 to 1,500,000 pounds. The quota in the area between False Cape and Point Arena, Calif., was lowered from 850,000 to 250,000 pounds.

The Commission made the changes at its August 24, 1962, meeting in San Francisco.

* * * * *

GROWTH STUDIES AND ABUNDANCE OF MARKET CRABS INVESTIGATED:

M/V "Nautilus" Cruise 62-N-2a-Crab (January 15-19, 1962), 2b (February 12-16), 2c (March 12-16), 2d (April 9-13), 2e (May 7-11), 2f (June 18-22): A series of cruises by the California Department of Fish and Game research vessel Nautilus in the coastal waters off central California from Bodega Bay to San Francisco. The two objectives of these cruises were: (1) to collect dungeness (market) crabs (Cancer magister) for growth studies, using traps and a 10-foot beam trawl, and (2) to determine time of occurrence and relative abundance of crabs in areas of operations.

Collections were made at selected stations from Bodega Head to San Francisco using a 10-foot beam trawl with a 1-inch mesh net, commercial-type crab traps, and 1-inch mesh crab traps. A $\frac{1}{2}$ -inch liner was added to the cod end of the trawl net in May, in order to collect crabs in the first post-larval stages. The crab traps were baited with squid and rockfish and fished overnight. Beam trawling was done at each station.

Each drag lasted about 20 minutes and covered three-quarters of a mile. Exploratory beam trawling was accomplished at stations where traps were not set (fig. 1).

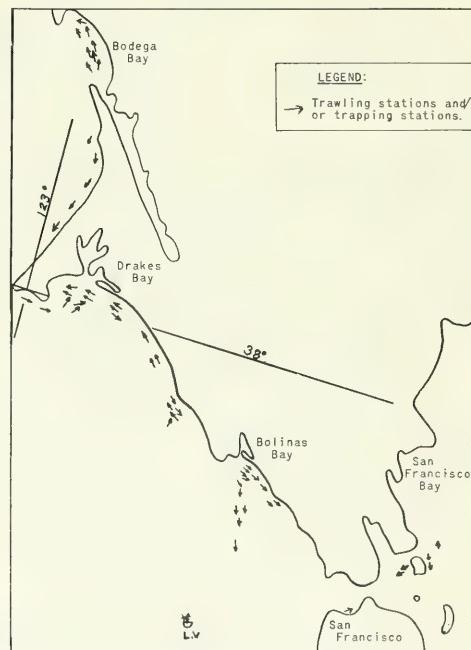


Fig. 1 - Cruises 62-N-2a through f by the research vessel Nautilus, showing location of trawl and trap stations.

It was possible to estimate age from the samples taken. At metamorphosis, crabs are about $4\frac{1}{2}$ to 5 months old, calculated from their January hatching. Collections of megalops in May showed the last larval stages averaged 3.7 millimeters. Those megalops were held in an aquarium for 24 to 48 hours where they molted into the first

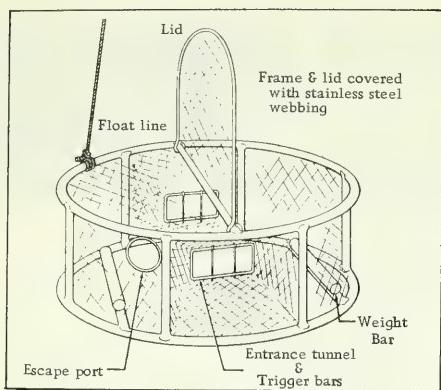


Fig. 2 - Diagrammatic sketch of a crab trap showing escape port.

postlarval crab. The molt resulted in an average size increase of 3.3 millimeters to first postlarval instars which averaged 7.0 millimeters in width (exclusive of antero-lateral spines). First postlarval crabs trawled during May also averaged 7.0 millimeters in shoulder width.

The table below provides continuity of data and shows preliminary instar and growth calculations for dungeness crabs as determined from collections and measurements made during this series of cruises and the cruises from June to December 1961. The width-frequencies of the market crabs taken in Bodega Bay were determined. Mean shoulder widths of the crabs within the range of each observed mode was calculated and is shown in the table. Each mean represents the average shoulder width of the various instars. The crabs have been followed through the 10th and 11th instars. Dates of occur-

rences include the month in which the crabs were first observed and the month in which they were last observed.

Mating activity of male crabs was determined by examining chelipeds for abrasions and other marks incurred while the male was clutching the female. The smallest male examined was 65 millimeters but none less than 132 millimeters had mating marks. Males over 180 millimeters in shoulder width showed fewer abrasions or marks, and were presumed to have been less active.

* * * * *

MIDWATER TRAWLING FOR SALMON FINGERLINGS CONTINUED:

M/V "Nautilus" Cruise 62-N-7a-Salmon (July 12-13, 1962) and 62-N-7b (July 23-27, 1962): The capture of marked salmon fingerlings on their seaward migration was the objective of both trips by the California Department of Fish and Game research vessel Nautilus. The vessel operated in the Carquinez Strait, using a nylon midwater trawl with a 25-foot square opening. Trawling was conducted between 8 a.m. and 3 p.m., with each tow lasting 20 minutes. Tows were alternated between upstream and downstream, and between the north shore center, and south shore of the channel.

A total of 72 tows completed in the Strait during the cruises yielded a catch of 56 king



Preliminary Instar and Growth Calculations for Male Dungeness Crabs as Determined by Means of Modes from a Width Frequency Graph
(Instar sizes 1 and 2 are assumed to be the same for both groups observed.)

Instar	Range in mm. 1/	Mean	Absolute Increase	Percentage Increase	Range in mm. 1/	Mean	Absolute Increase	Percentage Increase	Date of Occurrence
1	7-7	7	0	0	7-7	7	0	0	May-June
2	9-14	11.5	4.5	64.0	9-14	11.5	4.5	64.3	May-Aug.
3	14-19	16.0	4.5	39.1	14-19	15.9	4.4	38.3	June-Oct.
4	18-26	21.1	5.1	31.9	19-24	21.9	6.0	37.7	June-Dec.
5	23-33	27.8	6.7	31.8	26-33	29.2	7.3	33.3	Aug.-Feb.
6	30-41	35.6	7.8	28.1	33-44	39.0	9.8	33.6	Nov.-May
7	39-55	47.1	11.5	32.3	41-56	47.5	8.5	21.8	Nov.-May
8	54-73	63.4	16.3	34.6	56-76	65.4	17.9	37.7	Nov.-June
9	74-92	83.3	19.9	31.4	74-92	83.3	17.9	27.4	Jan.-
10	-	-	-	-	92-106	96.6	13.6	16.3	Feb.-
11	-	-	-	-	108-129	118.3	21.7	22.5	June

1/mm. = millimeters.

salmon (Oncorhynchus tshawytscha). None of these fish were marked.

Other Species Caught by the <u>Nautilus</u> on Cruise 62-N-7a and 62-N-7b	
Species	Number
Northern anchovy (<u>Engraulis mordax</u>)	103,000(est.)
Jacksmelt (<u>Atherinopsis californiensis</u>)	16,000(est.)
Sacramento smelt (<u>Spirinchus thaleichthys</u>)	800(est.)
Pacific herring (<u>Clupea pallasi</u>)	500(est.)
Striped bass (<u>Roccus saxatilis</u>)	417
King salmon (<u>Oncorhynchus tshawytscha</u>)	56
Northern midshipman (<u>Porichthys notatus</u>)	27
Surfsmelt (<u>Hypomesus pretiosus</u>)	3
American shad (<u>Alosa sapidissima</u>)	1
Three-spined stickleback (<u>Gasterosteus aculeatus</u>)	1

The morning of July 27 was spent in collecting bottom samples in the lower Napa River, in the vicinity of the atomic submarine refueling pens. The samples were to be tested for the presence, or lack, of atomic radiation by the Public Health Department.

Note: See Commercial Fisheries Review, September 1962 p. 15.

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PELAGIC FISH POPULATION SURVEY CONTINUED:

Airplane Spotting Flight 62-6-Pelagic Fish (June 13-14, 1962): To determine the distribution and abundance of pelagic fish schools, the area from the United States-Mexican Border to San Luis Obispo Bay was surveyed from the air by the California Department of Fish and Game's Cessna "182" 9042T.

No flights were made on June 11 and 12 because of low overcast. On June 13, the area from the United States-Mexican Border to Pt. Conception, Calif., was surveyed. Thirty-four anchovy schools were counted from the Tia Juana River to about 5 miles north of the river. The area around Pt. Loma could not be surveyed because of military air traffic. Between Dana Pt. and the Santa Ana River, 192 schools of anchovies were counted. Some of the schools were "breezing" and were visible for several miles. From the extent of "breezing" schools visible at sea beyond the limit of the plane's safety factor, it was estimated there were between 500 and 600 schools in the area. Between Topanga Canyon and Pt. Dume, 168 anchovy schools were counted and a few dim spots were observed around Santa Barbara.

The coastline from Long Beach Harbor to San Luis Obispo Bay was surveyed on June 14 but low clouds prohibited operating farther north. In addition to the concentration

between Topanga Canyon and Pt. Dume observed on June 13, anchovy schools were sighted in the central inshore Santa Monica Bay area, and also in the Port Hueneme-Santa Barbara and Los Angeles Harbor areas. There were 44 anchovy schools off Santa Monica and 41 between Port Hueneme and Goleta. Visibility was poor around Santa Barbara, and the few schools seen there were very dim. More schools probably would have been visible if weather conditions had been better.

For the first time in many months anchovy schools were seen from the air in the Los Angeles-Long Beach Harbor, and 61 schools were counted. Although no anchovy schools had been visible in the Harbor or around Santa Monica during previous flights during 1962, anchovies were present because live-bait boats were catching them. Sighting those schools from the air was probably because of clearer water.

Airplane Spotting Flight 62-7-Pelagic Fish (July 18-20, 1962): On the first day's flight, the coast from the United States-Mexican Border to Los Angeles Harbor was surveyed. The only fish observed were 54 anchovy schools between Pt. Loma and the Mexican Border. The large concentration of anchovies that was seen between the Santa Ana River and Dana Pt. on the June flight, apparently had moved out. This resulted in the bait boats that normally work the area having to go to Los Angeles Harbor for bait. The bait haulers blamed the disappearance of the anchovies on the clearing of the water, and the presence of bonito inshore.

On July 19, the area from Los Angeles Harbor to a few miles above Goleta Pt. was surveyed. Fourteen anchovy schools were spotted outside Los Angeles Harbor, and 21 in Santa Monica Bay. From Gorda Pt. to Goleta Pt., 400 anchovy schools were counted.

An attempt was made on the last day of the flight to survey the area from Monterey Bay to San Luis Obispo Bay. But because of a solid cloud bank along most of the coast, only San Luis Obispo Bay, Estero Bay, San Simeon Bay, and a small part of Monterey Bay could be covered. The fish count in those areas was 15 anchovy schools, which were sighted off the Cayucos pier in Estero Bay.

Note: See Commercial Fisheries Review, August 1962 p. 15.



Cans--Shipments for Fishery Products, January-June 1962

The amount of steel and aluminum consumed to make cans shipped to fish and shellfish canning plants during January-June 1962 was 4.1 percent above that used during the same period in 1961. Prior to this year, the figures covered only tinplate cans, but beginning with January 1962 aluminum cans are included. It is believed that only a small amount of aluminum is being used in cans used for fishery products at present.

A total of 1,511,133 base boxes of steel (tinplate) and aluminum were used in the manufacture of cans shipped to fishery plants during the first six months of 1962, whereas in the same period of 1961 (when only tinplate was reported) 1,452,246 base boxes of steel were consumed. The increase was mainly due to larger packs of Maine sardines and tuna during the first six months of 1962.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. The 1962 data are derived by use of the factor 21.8 base boxes per short ton of steel.

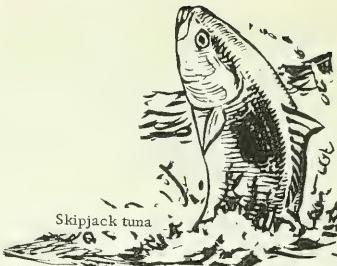


Central Pacific Fisheries Investigations

SKIPJACK TUNA SUBPOPULATION IDENTIFICATION STUDIES:

The relationship between seasonal changes in the abundance of skipjack (aku) tuna and changes in the chemical and physical properties of the ocean in the vicinity of the Hawaiian Islands is being studied by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu, Hawaii. By studying the physical properties of the ocean, it has been possible to predict whether or not the total annual landings of skipjack for a year will exceed or fall below a figure based on the average catch for about 10 years.

In the skipjack fishery of the Hawaiian Islands, it has long been known that large fish, called "season" fish, enter the fishery



in large numbers in the spring and summer only to disappear again in the fall and winter.

It is now known that there is a relationship between the changes which occur in the early spring in the physical properties of the ocean circulation systems in the Hawaiian chain and the relative abundance of "season" skipjack found later in the spring and summer.

In order to understand more completely the biological significance of those findings, the Laboratory has been carrying out a sampling program in which two measures of the skipjack population have been obtained.

One of the two measures involves a study of chemical substances which occur on the red blood cells of nearly all red-blooded animals. These chemicals, called blood group substances (like the A and B substances of man, for example) are products of genes, the units of inheritance, which govern the basic developmental processes of all living things. Because blood group substances are produced by genes, it is possible to genetically classify populations by means of counting the relative proportions of one or more blood group substances which occur in the population. If two samples of skipjack have different frequencies of the same substance, it is certain that they were taken from two different populations. It has recently been observed that in skipjack samples obtained from Hawaiian waters, two distinctly different frequencies of the same substance in the B-system of aku blood groups occur.

The second measure of the populations studied has to do with measuring the lengths of a large number of fish. In some years, the relative numbers of fish that are two years old (judged by length) is very much greater than the number of 1-year old fish present in the previous year. This finding

implies that many 2-year old fish are entering the fishery from another population.

Both lines of evidence presented are consistent with the idea that there are two different populations of aku which enter the fishery. One population composed of fish of all sizes, both large and small, and classified by blood group studies as population I fish, are found in all seasons. Fish of the other population, or population II fish, have only been found to be large.

The question that arises is, where do the group II fish come from? So far this is not known. But it is interesting to note that a skipjack tagged near Baja California, Mexico, was caught on June 12 near Oahu, Hawaii, weighing 26 pounds when caught, just slightly larger than the mean of group II fish sampled in the summer of 1962.

The next step in the study being made is to attempt to determine the relationship between group II fish and skipjack populations to the east of Hawaii, and also to ascertain the relationship between those fish and the physical oceanography which plays such an important role in their migratory habits.

Note: See Commercial Fisheries Review, June 1962 p. 7.



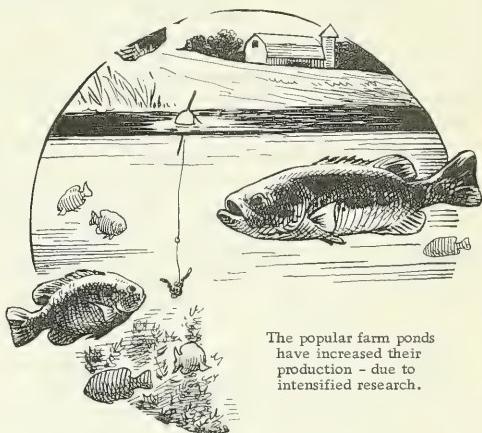
Fish Farming

Some of the highlights of the program at the Stuttgart, Arkansas, Fish Farming Experimental Station of the Bureau of Sport Fisheries and Wildlife during April-June 1962:

CONSTRUCTION OF FACILITIES: Forty-five experimental ponds (including 20 0.1-acre ponds, 20 0.25-acre ponds, and 5 1.0-acre ponds) were accepted by the Regional Engineer of the Bureau on April 27, 1962. Three well houses with pumps and the storage reservoir were accepted at the same time. All completed experimental ponds at the new station had been filled with either surface or ground water and stocked with fish by June 1962. A contract will probably be negotiated before the end of 1962 to complete 36 additional experimental ponds (including 16 0.1-acre ponds, 16 0.25-acre ponds, and 4 1.0-acre ponds) by installing water supply lines, drains, and concrete structures with valves.

Severe problems due to water quality became very prominent in early May and a contract was let on May 16, 1962, for the construction of a water-treatment plant. The plant, which will remove excess iron and manganese from the water supplied to the laboratory and service buildings, was completed in the summer of 1962.

RESEARCH: Nutrition: Sixteen 0.25-acre ponds were stocked with fingerling channel catfish and fed experimental feeds. Some of the feeds are available commercially and others were formulated at the Experimental Station.



The popular farm ponds have increased their production - due to intensified research.

Protein studies were interrupted in the spring of 1962 by water quality problems. But new studies were started July 1, 1962, using channel catfish fry kept in troughs. They were fed test rations to get comparative data on various high protein meals which are commercially available.

Fish Cultural Studies: Successful spawning of channel catfish, flathead catfish, Israeli carp, and buffalofish was accomplished with the use of 700 international units of chorionic gonadotrophins per pound of body weight. Catfish eggs of both species hatched well but considerable difficulty was experienced in getting the flathead fry to feed. The carp and buffalofish eggs failed to hatch probably because of water quality problems.

Hybridization attempts between species of catfish, buffalofish, and carp-buffalofish

crosses were unsuccessful. In addition to chorionic gonadotrophin injections of the females, delatestrel (testosterone enanthate) was administered intraperitoneally into the males to intensify the spawning drive. Some response was apparent in Israeli carp males when placed in spawning aquaria with buffalo-fish females.

Studies began on the possible sterilization of Israeli carp fingerlings by using diethyl-stilbesterol in the daily ration at levels of 1 and 2 percent.

Studies have been started to determine the best combinations of species and the proper stocking ratios which will provide optimal production in fish-farming reservoirs. Growth rates will be followed to determine the most desirable species combinations and stocking ratios for efficient use of natural foods.

Fish-rice rotation tests, programmed over a four-year period, as well as studies on the effect on yields of simultaneously growing fish and rice are under way. In addition to station ponds, a nearby 20-acre rice field has been stocked with fingerling channel catfish to determine the survival and growth rate of the fish in a flooded rice field.

Fertilization: Selected ponds (0.1 acre) have been fertilized with varying proportions of common fertilizing compounds. Various types of nitrogen compounds are also being tried along with super phosphate. Changes in the flora and fauna and in total plankton are being followed. Laboratory experiments are also in progress.

Note: See Commercial Fisheries Review, September 1962 p. 23.



Food Congress

INTERIOR DEPARTMENT EXHIBIT AT FIFTH INTERNATIONAL FOOD CONGRESS:

Helping the fishing industry bring seafood to home and institutional tables in the most efficient way possible and in conserving the wealth of fishery resources was the theme of a special exhibit by the U. S. Department of the Interior at the Fifth International Food Congress and Exhibition. The Congress, held at the New York Coliseum, New York City, September 8-16, 1962, was attended by delegates from more than 30 countries.

This was the first time it was held in the United States.

The Department of the Interior's Bureau of Commercial Fisheries exhibit was located in the International Pavilion. Four panels, with special lighting effects, comprised the exhibit, and each panel depicted a different phase of the Bureau's efforts in furthering the use of fishery resources.

The title of the first panel was "The Resource," and it showed the Bureau's biological fishery research work. Four telephones connected with the panel carried taped messages for the 50,000 or more executives of food and allied industries, and the more than 250,000 consumers who were expected to visit the exposition and view the exhibits.

The panel named "Harvesting" depicted some of the efficient fishing methods that have been developed, including the air bubble curtain which is capable of catching a school of fish, plane spotting of fish from the air, bottom and midwater trawling, and electronic fishing.

The third panel illustrated newly-developed fish products made possible by technological research and advancement--irradiated fish which have a much longer shelf life than fresh fish, and fish protein concentrate (fish flour) which could be the lifeline of the future for millions of the world's under-nourished and protein-deficient populations.

The services of the Bureau of Commercial Fisheries in the field of marketing, and the collection and dissemination of market news were shown in the final panel of the exhibit, including research conducted in test kitchens at the Bureau's Technological Laboratory at College Park, Md. Some of the research equipment used by the Bureau and illustrations of the various market forms of fish completed the display.

"Fishery products play such an important role in a nutritious diet today that it has been decided that this source of nutrition merits special consideration," the Food Congress said in inviting the Bureau to participate in the international event.

In acknowledging the invitation on behalf of the Department, Secretary of the Interior Stewart L. Udall said fisheries research heralds new frontiers in nutrition and health for America's citizens and its neighbors across the seas.

In his June 11 letter of acknowledgment, the Secretary wrote that the United States Department of the Interior was very much interested in the Congress, especially since it afforded a unique opportunity for an exchange of ideas on the international plane.

The Secretary mentioned that in September 1961, the United States hosted the International Conference on Fish in Nutrition, sponsored by the Food and Agriculture Organization of the United Nations. That conference was held in Washington, D. C., and was attended by scientists and industrialists from 33 nations. At that conference, it was pointed out that more than half of the peoples of the world are suffering from malnutrition. Many millions lack enough of the proper food ingredients for an adequate and balanced diet and numbers are suffering from diet associated diseases. The Secretary said it was clearly established that protein from the sea was the key to meeting these worldwide dietary associated problems. Fish protein offers the most practical way of meeting the dietary needs of the undernourished of the world. This, he said, was the message to be presented to the food industry through the Department of the Interior's exhibit.

Secretary of the Interior Udall was a member of the Committee of Honor of the Fifth International Food Congress and was represented at the meetings by officials of the Bureau of Commercial Fisheries.



Frozen Fish

NEW MECHANIZED MICROWAVE OVEN FOR THAWING FROZEN FISH:

A United States firm has designed a new microwave oven defroster with openings on both ends so that a conveyor belt can pass through the oven. The conveyor belt can feed frozen fish into the oven and remove the fish after they are thawed. Previous microwave ovens had to be completely enclosed to trap the microwave energy. An innovation in design enables the new oven to trap the microwave energy without being sealed.

The microwave energy compartment in the new oven is three feet long. As frozen fish pass through the compartment, they are penetrated by ultra-high-frequency deep heat and thawed in 60 seconds.

A Canadian biochemist researcher is still testing the effects of microwave defrosting on fish. The researcher plans to refreeze radar-defrosted fish, store the fish for one year, and then defrost them again for flavor and food-value analyses. Also, another phase of the study, in progress for one year, has been the evaluation of the most efficient method of freezing fish at sea. (South African Shipping News and Fishing Industry Review, May 1962.)



Great Lakes Fisheries

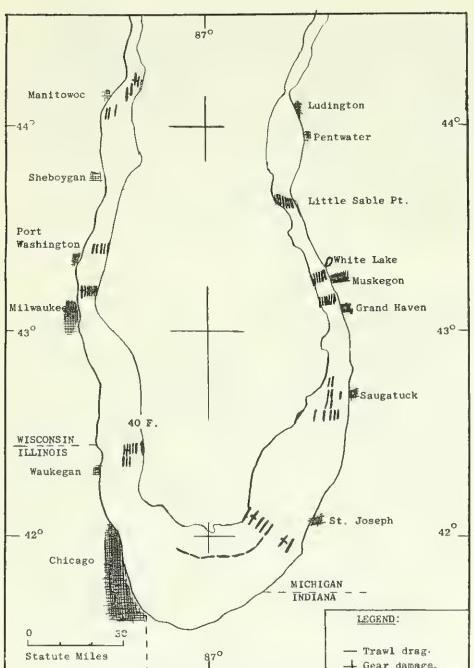
Exploration and Gear Research

TRAWL FISHING INVESTIGATION OF SOUTHERN LAKE MICHIGAN:

M/V "Kaho" Cruise 3 (June 12-August 29, 1962): A three-month trawl fishing investigation of southern Lake Michigan was completed on August 29, 1962, by the exploratory fishing vessel Kaho of the U. S. Bureau of Commercial Fisheries. Principal objectives of the cruise were to study the bathymetric or distribution in depth of various fish stocks and determine their availability to commercial types of otter-trawl fishing gear periodically at certain selected geographical locations. The over-all area of operations extended around the southern perimeter of Lake Michigan from Little Sable Point, Mich., on the east shore, to Manitowoc, Wis., on the west shore.

A total of 142 30-minute drags were made at depths ranging from 9.5 to 40.5 fathoms at sampling stations established during previous cruises (see chart). An additional 40 drags (ranging from 15 minutes to 2 hours duration) were made to compare effectiveness of fishing gear modifications and day-night fishing.

Commercially-significant catches were taken during each of the 3 phases; however, the final phase in August was considerably more productive than either the June or July phases. Catches were all poor (less than 400 pounds per hour) on the east shore during the June phase. On the west shore, however, catches of over 600 and up to 830 pounds per hour were taken at all but 1 of the 4 sampling stations. During the July phase, catches of 510 to 640 pounds per hour were taken at 3 of the 5 east shore sampling stations, and 648



Lake Michigan explorations by M/V Kaho on Cruise 3 (June 12-August 29, 1962).

to 1,242 pounds per hour at 2 of the 4 west shore sampling stations. All 9 stations yielded 636 or more pounds per hour during the August phase.

Catches of over 1,000 pounds per hour were taken as follows: phase I--none; phase II--at 15 and 20 fathoms off Waukegan; phase III--at 10, 15, and 20 fathoms off Little Sable Point, at 15 fathoms off Grand Haven, at 35 fathoms off Milwaukee, and at 20 and 25 fathoms off Port Washington. The best catch (1,200 pounds) was taken in a 30-minute drag at 20 fathoms off Port Washington.

Depths yielding best catches varied within each sampling station from period to period, but did not vary uniformly from area to area during any particular period.

The percentage breakdown of principal species making up the total actual catch of 35,949 pounds of fish taken during the cruise

was as follows: chub (Coregonus hoyi)--82.6 percent, large chub--8.3, alewife--7.6, yellow perch--1.2, and smelt--0.2 percent. All other species accounted for less than 0.1 percent of the total catch. Alewife appeared in a total of 69 catches, and from 50 to 520 pounds were taken in 15 drags at 10 to 25 fathoms. Yellow perch appeared in 48 catches, and from 15 to 145 pounds were taken in 5 drags at 10 and 15 fathoms in phases II and III. Smelt appeared in 26 catches; less than 15 pounds per drag were taken in 25 drags, and one catch of 50 pounds was taken at 15 fathoms off Waukegan during phase II. Only 4 individual whitefish were taken in 4 separate drags. Herring appeared only in amounts of less than 1 pound and in only 5 drags. Other species noted in the catches included: lake trout (two only), cottids (sculpins), sea lamprey, suckers, and trout-perch.

A special test designed to compare day and night trawling effectiveness was conducted off Saugatuck in June and August and off St. Joseph in July. Each of the tests were confined to a limited area and depth zone. In June, 6 daylight drags averaged 215 pounds per hour and 5 night drags averaged only 86 pounds per hour. In July, 3 daylight drags averaged 167 pounds per hour and the 3 night drags, 149 pounds per hour. In August, the catches averaged 618 pounds per hour for 2 daylight drags as compared to 75 pounds per hour for 2 night drags.

During July 10-12, operations were conducted in cooperation with the U. S. Department of Agriculture to obtain and process C. hoyi chubs for Agriculture's mink-feeding experiments at the Cornell University Fur Animal Research Farm. A refrigerated water system was used to hold about 2 tons of the fish in a preliminary study to determine the practicality and problems involved in this type of storage aboard Great Lakes' commercial fishing vessels.

Surface temperatures ranged from 47° to 70° F. during phase I; 57° to 72° F. during phase II; and 48° to 75° F. during phase III.

A standard 52-foot (headrope) Gulf of Mexico semiballoon-type trawl net was fished on the routine sampling stations. A new 65-foot nylon modified-West Coast box-type trawl was compared with the standard net with favorable results, but the data obtained were insufficient to make exacting determinations.

Slight to moderate gear damage was incurred by bottom obstacles during 7 of the 182 drags.

Underwater television tests were conducted in cooperation with a private firm during the final 2 days of phases I and III. Gear configuration and fish behavior within the net were studied with good results.

The Kaho was expected to depart Saugatuck, Mich., September 19, 1962, on cruise 4 en route to Lake Erie for 29 days of exploratory trawl fishing operations. All United States waters of Lake Erie were to be explored. The primary objective of the cruise was to extend seasonal knowledge regarding the location, bathymetric or distribution in depth, relative abundance, and availability of various species of fish to standard otter trawl fishing gear. Echo-sounding equipment was to be used to survey bottom conditions and record fish concentrations. Bathymograph casts and bottom samples were to be taken at each fishing station. A 52-foot (headrope) Gulf of Mexico-type otter trawl was to be used at standard stations to assess the commercial trawling potential. A newly-designed 65-foot western-style otter trawl was to be tested to determine its effectiveness on Lake Erie fish.

Note: See Commercial Fisheries Review, July 1962 p. 20.



Great Lakes Fishery Investigations

DISTRIBUTION OF LAKE TROUT IN WESTERN LAKE SUPERIOR STUDIED:

M/V "Siscowet" Cruise 5 (August 14-19, 1962): Studies to obtain information on the abundance and distribution of native and hatchery-reared lake trout in western Lake Superior waters were conducted by the U. S. Bureau of Commercial Fisheries research vessel Siscowet. Work was done at Shelter Bay (near Laughing Fish Point), Keweenaw Bay, and Traverse Bay, Mich.

Semiballoon trawls were fished at depths of 16 to 42 fathoms and standard gangs of experimental gill nets (1- to 5-inch mesh by $\frac{1}{2}$ -inch intervals) were fished at 17 to 77 fathoms.

Five 10-minute trawl tows in Shelter Bay yielded only 6 lake trout, all of which were hatchery-reared fish planted at Munising

(4 were from the 1962 plant, and 1 each from the 1961 and 1960 plant). In Keweenaw Bay, 13 tows yielded 26 small lake trout, of which 18 had been stocked as yearlings in Keweenaw Bay in 1961 and 8 in 1960 (2 planted from shore and 6 by boat). The average length of the recaptured lake trout from the 1961 plant (8.2 inches) was 3.2 inches longer than at the time of planting. Four tows in Traverse Bay yielded 12 lake trout, all of which were fin-clipped. Nine of those fish had been planted in Traverse Bay in 1962, 2 in Keweenaw Bay in 1961, and 1 in Keweenaw Bay in 1960. Other species caught in trawls at the different stations included smelt, pygmy whitefish, sculpins, ninespine sticklebacks, and small coregonines (family of whitefishes).

Experimental gill nets were set in Keweenaw Bay northwest of Point Abbaye and northeast of Pequaming (see table).

Species	Number of Species Caught by M/V <u>Siscowet</u> from One-Night Sets		
	Location and Depth (Fathoms)		
	Point Abbaye 17-24	20-33	63-77
..... (Number)			
Chub:			
<u>C. hoyi</u>	31	68	170
<u>C. kiyi</u>	18	7	34
<u>C. zenithicus</u>	7	39	50
Lake herring	15	8	1
Lake trout	13	24	-
Smelt	69	55	-

Of the 37 lake trout caught, 25 fish or 68 percent were fin-clipped. The fish ranged in length from 9.1 to 20.0 inches.

The chub were in various stages of sexual development. Of the Coregonus zenithicus, about half were nearly ripe and the other half were spent. Most of the C. kiyi had well-developed gonads (sexual glands), although 2 were spent, and 2 were ripe. All C. hoyi had well-developed gonads.

Surface water temperatures ranged from 56.3° F. in Traverse Bay to 60.8° F. in Keweenaw Bay.

Scheduled cruises 3 and 4 were cancelled to allow time for extensive alteration of the Siscowet at a Wisconsin shipyard. The addition of five feet to the length of the vessel, and reconstruction of the stern, added much-needed work space to the back deck. The improvements greatly facilitate the operation of trawls, gill nets, and other experimental gear.

Note: See Commercial Fisheries Review, September 1962 p. 26.

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LAKE MICHIGAN FISH POPULATION SURVEY CONTINUED:

M/V "Cisco" Cruise 6 (August 7-20, 1962): The depth distribution of fish during and after an extensive upwelling, and the distribution of small coregonines (fresh-water whitefish), were the principal objectives of Cruise 6 in southeastern Lake Michigan by the U. S. Bureau of Commercial Fisheries research vessel Cisco.

A moderately strong upwelling near shore persisted throughout much of the cruise. According to unofficial reports from various sources, it extended as far south as Michigan City, Ind., at the southern extremity of the lake, and at least as far north as Grand Haven, Mich. Off Saugatuck, Mich., the coldest surface water temperatures (near 11° C. or about 52° F.) were within 3 or 4 miles from shore (out to depths of 10 or 15 fathoms), but strong currents and eroded metalimnions extended as far as 33 miles offshore (84 fathoms). Trawl hauls in shallow water during and after an upwelling on August 15 and 17 indicated drastic changes in fish distribution as shown in table.

Number of Different Species Caught by M/V Cisco in Shallow Water						
Date (Aug.)	Depth (Fms.)	Bottom Water Temperature (F.)	Species 1/			
			Chub	Yellow perch	Alewives	Smelt
15	5	47	4	1,600	48	18
15	7	46	34	138	22	62
17	7	64	0	30	60	2
15	10	44	45	470	51	47
17	10	62	0	7	43	1
15	12	43	154	704	7	28
17	12	60	3	83	12	7
15	15	42	199	38	29	32
17	15	51	28	450	17	51
15	17	47	485	178	50	138
15	20	42	365	0	12	0
17	20	46	304	2	23	5
15	25	41	75	0	2	0

1/ In addition to the species shown in the table, a few spottail shiners were collected at depths of 5 to 12 fathoms, and moderate numbers of slimy sculpins at 15 to 25 fathoms. The chubs taken were Coregonus (Leucichthys) hoyi, with extremely few exceptions. About 75 percent of the yellow perch caught at 5 fathoms on August 15, and all of the perch caught at 7 fathoms on August 17 were yearlings; all other perch catches included very few yearlings, and no young of year.

Both yellow perch (except yearlings) and chubs moved into deeper, colder water as the cold water near shore was replaced. The chubs remained in colder water than the yellow perch, both during and after the upwelling. Smelt also moved out as the warm water moved in, but the distribution of alewives seemed to be unaffected.

Attempts to locate chubs less than 7 inches long with a midwater trawl, large-mesh half-meter plankton nets, and a 4-foot tow net of $\frac{1}{4}$ -inch mesh (stretched) were unsuccessful. The midwater trawl, of a modified British Columbia design, caught a few alewives and C. hoyi (7.7 to 10.4 inches long) in several midwater tows over bottom depths of 15 and 40 fathoms. Fry, tentatively identified as alewives, were widely distributed in the upper 10 fathoms of water, out to a depth of at least 40 fathoms. Several alewife fingerlings (1.1 to 1.4 inches) were caught in the upper 15 fathoms of water, over the 30-fathom depth. Two fry, believed to be deep-water sculpin, were caught in a tow between 16 and 28 fathoms, over the 84-fathom depth.

Gangs of nylon gill nets were set at 40 and 84 fathoms to collect chubs for blood samples for an electrophoresis and serological study. The deeper set made a good catch of Coregonus kiyi, some of which were rather large.

Two days of the cruise were lost due to valve trouble on the main engine.

During Cruise 5 (July 17-31, 1962) the M/V Cisco was under contract to the U. S. Public Health Service. Hydrographic and bacteriological data were collected at 30 stations in southern and central Lake Michigan. No report on that cruise will be issued by the Bureau's Ann Arbor Biological Laboratory.

Note: See Commercial Fisheries Review, August 1962 p. 23.

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LAKE ERIE FISH POPULATION SURVEY CONTINUED:

M/V "Musky II" (August 1962): The fish population survey in Lake Erie was continued by the U. S. Bureau of Commercial Fisheries. Operations of the research vessel Musky II in August included the seasonal three day-night series of trawl hauls (two 10-minute tows at each of three depths during the morning, afternoon, and evening) at stations 4 (East Harbor) and 49 (Bono) and the annual week-long cruise to seven index stations distributed about the western basin.

The summer series of three day-night trawl hauls provided further evidence of good spawning success and subsequent survival for most species of fish. Young yellow perch, white bass, and yellow pike (walleye) were particularly abundant as compared to other

recent years. Yellow perch were plentiful in all areas sampled; thousands were caught in many 10-minute drags of the trawl. Young yellow pike were abundant, but their distribution was less uniform (catches may have been influenced by meteorological conditions). A total of 447 young were taken at station 4 and 37 at station 49.

The fishery-limnological cruise to the seven index stations was conducted to preserve continuity and for comparison with similar operations of the past 3 years. Two trawl tows were taken at each station and turbidity, pH, temperature, alkalinity, and dissolved-oxygen content of the water were determined. The water was stratified at two of the stations (off Monroe, Mich., and north of Pelee Island), but no oxygen deficiencies were observed.

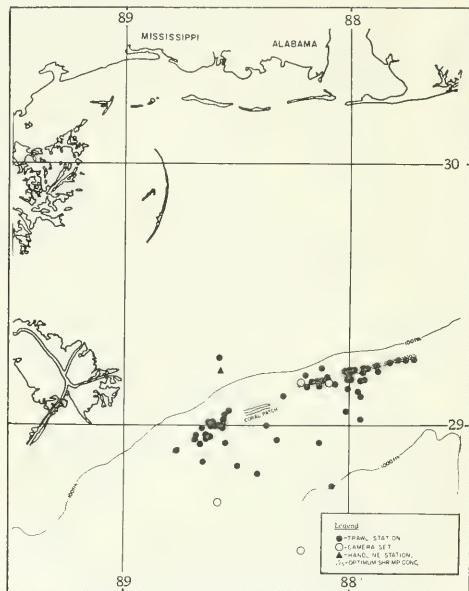
Growth of young-of-year fish of most species appeared to be about average. The mean length of young yellow pike at the end of August was about 7.0 inches, an increase of 2 inches over the preceding month. This represents slightly faster growth than in 1960 or 1961, but slower than in 1959. Average total lengths in inches of young fish of other species were as follows: yellow perch, 2.5; white bass, 2.7; gizzard shad, 4.2; sheepshead, 2.8; alewife, 3.8; smelt 2.1; spottail shiner, 2.1; and emerald shiner, 1.9.

The large population of older perch is still dominated by 3-year-old fish of the 1959 year class. The average length of these perch is now 8.2 inches; they should reach about 8.5 inches toward the end of the Ohio commercial fishing season.

Water temperatures averaged 74° F. in the western end of the lake. Critically low dissolved oxygen was observed for the first time this year (toward the end of August) in the deeper areas of the central basin off Lorain, Ohio. Observations will be continued to determine the extent and duration of the deficiency.

Note: See Commercial Fisheries Review, September 1962 p. 26.

79 by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon in the northern Gulf of Mexico were in two phases: (1) to explore the continental slope between 150 and 1,000 fathoms to assess the deep-water crustacean and fish potential of that area, and (2) to gather additional information on the seasonal distribution and occurrence of the royal-red shrimp (*H. robustus*) and a smaller deep-water shrimp (*P. megalops*).



Northern Gulf of Mexico explorations by M/V Oregon Cruise 79 (July 24-August 14, 1962).

A total of 60 trawl drags were completed during the cruise, 35 of which were made in the royal-red shrimp depth range between the Mississippi Delta and Pensacola, Fla. Royal-red shrimp were caught in small to moderate quantities--up to 109 pounds (heads-off) per 2-hour tow--in all drags completed between 200 and 260 fathoms with the largest catches in the 200- to 225-fathom depth range. Twenty-five tows completed in that depth range yielded 1,135 pounds of 31-35 count (heads-off) royal-red shrimp. Smaller deep-water shrimp (*P. megalops*) averaging 52 count heads-on were caught in quantities up to 150 pounds per 2-hour drag at depths ranging from 180 to 200 fathoms. The scarlet



Gulf Exploratory Fishery Program

NORTHERN GULF OF MEXICO
EXPLORATION FOR POTENTIALLY-
VALUABLE DEEP-WATER SPECIES:

M/V "Oregon" Cruise 79 (July 24-August 14, 1962): The primary objectives of cruise

prawn (*P. edwardsianus*) was caught most frequently in 350 fathoms--up to 4 pounds of the 10-count size were caught in each drag.

Large red crabs (*Geryon* sp.) were caught in 600 to 750 fathoms at rates up to 140 pounds (75 individuals) per drag. Young crabs of the same species were found to be heavily concentrated in 200 fathoms.

Hake (*Urophysis* sp.) and whiting (*Merluccius* sp.) were the predominant fish species caught in the 100- to 300-fathom depth range. Catches ranged to 1,000 pounds per 2-hour tow. Beyond 300 fathoms, 90 percent of the catch (by weight) was comprised of macrourids (suborder of Decapoda crustaceans). Two 20- to 25-pound macrourids were caught at a depth of 600 fathoms.

Both shrimp and fish trawls used on cruise 79 were rigged in the usual manner with loop chain and/or mud rollers. Tickler chains were used on all rigs. The trawls which included flat, semiballoon, and balloon designs varied in size from 40 to 130 feet along the headrope and were fished with appropriate size chain bridle or bracket doors. The smaller trawls (40 to 70 feet long) were fished with a single warp and bridle, and the larger trawls with two warps.

Sea bottom conditions were suitable for trawling operations throughout the area surveyed with the exception of one large concentration of coral trees located in 230 fathoms at $29^{\circ}03'N$. and $88^{\circ}25'W$. One trawl was damaged by bogging in the mud, and gear fouling occurred occasionally due to strong surface currents in the fishing area.

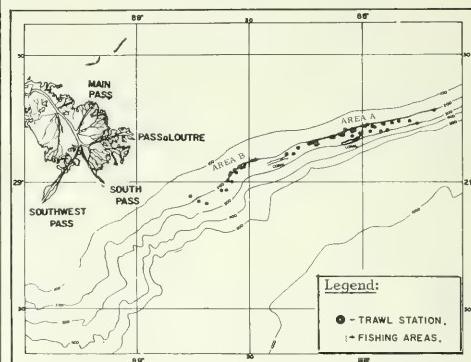
Sea bottom temperatures and sediment samples were obtained at each transectional trawling station between 150 to 1,000 fathoms. Marine life data were tabulated and entered on station sheets. Representative fish and shellfish samples were preserved and stored for future study by the Bureau's staff biologists.

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GOOD ROYAL-RED SHRIMP CATCHES BY RESEARCH VESSEL:

M/V "Oregon" Cruise 80 (August 21-31, 1962): To determine the current production potential of royal-red shrimp (*Hymenopenaeus robustus*) in the areas east of the Mississippi Delta was the main objective of this 10-

day cruise in the northern Gulf of Mexico. The areas worked on Cruise 80 had been delineated on previous cruises by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon, which returned to her base at Pascagoula, Miss., on August 31.



Northern Gulf of Mexico explorations by M/V Oregon Cruise 80 (August 21-31, 1962).

A total of 51 drags in the 200-300 fathom depth range between longitude $88^{\circ}46'W$. and $87^{\circ}41'W$. yielded 2,616 pounds of 31-35 count heads-off ungraded royal-red shrimp. Major fishing effort by the Oregon was concentrated in the two areas shown on the cruise chart as A and B.

Another 23 drags completed in 225 fathoms (optimum depth) in Area A yielded 1,393 pounds of 31-35 count heads-off shrimp. The best catch in Area A amounted to 130 pounds of heads-off shrimp in a 2-hour drag.

Eight tows made in 200 fathoms (optimum depth) in Area B produced 801 pounds of 31-35 count heads-off shrimp. The best catch was 261 pounds of 31-35 count heads-off shrimp in a 3-hour drag. Smaller catches (10 to 50 pounds heads-off) were made beyond the optimum depth range in both areas. Larger shrimp (21-25 to 26-30 count, all heads-off) were caught in small quantities in 240 to 250 fathoms at the western end of Area B.

Peneopsis megalops shrimp (average 52-count heads-on) were caught in amounts up to 183 pounds per two-hour tow at depths ranging from 190 to 200 fathoms.

A 900-pound sample of royal-red shrimp from both areas was graded, and yielded 500 pounds of 26-30 count (55 percent), 325 pounds of 40-50 count (36 percent), and 75 pounds of 50-60 count (8 percent) shrimp, all heads-off.

Hake (*Urophysis* sp.) and whiting (*Menticirrhus* sp.) dominated the fish species caught in Areas A and B beyond 200 fathoms. Catches of those species combined ranged to 1,000 pounds per 2-hour drag. In Area B, large catches of macrourids (other species of crustaceans such as shrimp and lobsters) averaging 1,500 pounds per 2-hour drag were caught in 190-195 fathoms.

Two broadbill swordfish (*Xiphias gladius*) weighing 46 and 57 pounds each were caught in one trawl tow in 190 fathoms in Area B.

A two-seam 2-inch mesh nylon balloon-trawl measuring 112 feet along the headrope and fished with 14-foot chain bridle doors, was used in the production trials. The trawl was fished with both loop chain and mud rollers and was equipped with a tickler chain. No difficulty was experienced in fishing the area, and gear damage and fouling was negligible. Some catches were lost in Area B due to shark damage to the cod end. That was overcome by the addition of a twine and chain cover over the cod end.

Bottom temperatures in the red shrimp depth range varied from 9° C. to 12° C. (48.2° F. to 53.6° F.).

Information on gear used and results of catches was relayed by radiotelephone to interested industry members. A commercial shrimp vessel from Freeport, Tex., arrived on the red shrimp grounds and fished in company with the Oregon. Catches of 1 to 2 boxes of heads-off shrimp per three-hour drag were reported by the commercial vessel.

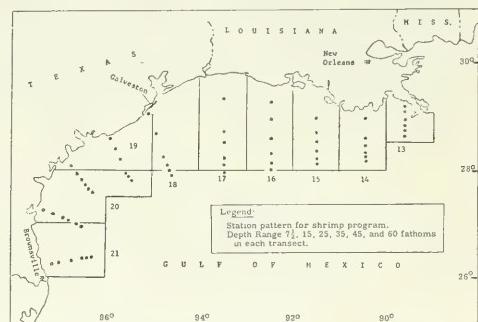


Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Belle of Texas" Cruise BT-26 (August 17-23, 1962): Shrimp catches by the research vessel Belle of Texas on this cruise were composed of 50 percent large brown shrimp (a little more than 100 pounds) counting 12-15 and 15-20 to the pound. The

rest of the catches (better than 100 pounds) consisted of modest quantities of smaller brown shrimp ranging from 21-25 to 41-50 count per pound, and only a handful of white and pink shrimp. The best catches of small and medium brown shrimp were made in the 20-40 fathom depth range. The vessel (operated by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries in studying the distribution of shrimp in the Gulf of Mexico) returned to her home port on August 23.



Shows the station pattern for Cruise BT-26 of the M/V Belle of Texas, August 17-23, 1962.

Five statistical areas were worked during the 7 day cruise, and a 45-foot shrimp trawl was used. One 3-hour tow was made in each of the 3 depth ranges in each area.

The largest single catches of 33 pounds each were in the 20-40 fathom depth range in 3 separate areas. These were all brown shrimp of 3 different sizes: 12-15 count in area 16, 21-25 count in area 15, and 31-40 count in area 13.

Area 14 yielded 28 pounds of 12-15 count brown shrimp in the 40-60 fathom depth, and 16 pounds of the same size brown shrimp in 20-40 fathoms.

The largest catch of any area was 59 pounds in area 15 which netted 24 pounds of 41-50 count brown shrimp and 5 pounds of 15-20 count white shrimp in the depth up to 20 fathoms, as well as the 33 pounds of 21-25 count shrimp from 20-40 fathoms. Less than one pound of 12-15 count pink shrimp was caught in 0-20 fathoms of that area.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.
(2) See Commercial Fisheries Review, Sept. 1962 p. 29.



Industrial Fishery Products

MENHADEN OIL STIMULATES GROWTH OF CHICKS:

Menhaden oil may have unique value in poultry feeds. A scientist at the Lipman Research Center, Augusta, Maine, conducted comparative tests on various poultry feeds. Chicks fed a mixture containing 1 percent menhaden oil and 5 percent poultry fat gained more weight than those fed rations containing 6 percent of either hydrolyzed animal and vegetable fat or poultry fat or various combinations of those fats with menhaden oil other than the combination of 1 percent menhaden oil with 5 percent poultry fat. Efficiency of feed utilization (feed consumed divided by weight gained) with the latter combination was equaled only by 6 percent of hydrolyzed animal and vegetable fat. The results suggest that menhaden oil in combination with poultry fat yields better results than one would expect on the basis of the total energy value of the combined fats. The findings were announced in the July 1962 issue of *Poultry Science*, the official journal of the Poultry Science Association.

One percent of fish oil in a broiler ration is very near the maximum ordinarily recommended and 2 percent is excessive. A taste panel judged the meat of broilers that had received 1 percent menhaden oil "acceptable," that of the ones which received 2 percent "questionable," and meat of broilers that received over 2 percent of the oil "unacceptable" because of "off" flavors.

The high rates of weight-gain and levels of feed efficiency obtained from menhaden oil and poultry fat raise the question as to whether or not the fish oil in combination with various other fats would yield results as good as, or even better than, the results with poultry fat. Further research also should show whether or not menhaden oil will retain its growth-promoting effect in the presence of an antioxidant such as ordinarily is added to a highly unsaturated oil.

* * * * *

FISH SOLUBLES STIMULATE GROWTH OF CHICKS:

There is distinct evidence that fish solubles stimulate the growth of chicks. This finding was announced recently by a group of poultry nutritionists who analyzed data compiled at the U. S. Department of Agriculture's Research Center, Beltsville, Md.,

between 1952 and 1960. The analysis showed that 4-week-old chicks fed fish solubles were significantly heavier than were the controls that received no solubles. The average difference in weight was 6 percent. The number of chicks involved in the study was over 8,000. Half that number of chicks were fed a ration containing solubles but no other non-vegetable protein. The other half were fed an identical ration without solubles.

The nutritional study was made with growth data accumulated from routine feeding trials, in order to answer questions as to the growth-promoting effect of fish solubles (the liquid separated from fish in the production of fish meal and oil is called fish solubles). Most investigators who have worked with the product have reported that fish solubles are effective in promoting growth of chicks, but some groups have reported negative results. Because of such findings, many specialists have questioned the chick growth-stimulating property of fish solubles, and this prompted the Beltsville nutritionists to analyze the 8-year accumulation of data. With the new and more recent information at hand, there is little doubt that fish solubles stimulate the growth of chicks.

The study was conducted by the Agricultural Research Center's poultry nutritionists who used data obtained with crossbred male chicks between the ages of 6 and 28 days. Their findings were reported in the July 1962 issue of *Poultry Science*, the official journal of the Poultry Science Association.

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U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-July 1962: Based on domestic production and imports, the United States available supply of fish meal for the first 7 months of 1962 was 41,219 short tons or 14.1 percent greater than during the same period of 1961. Domestic production was 1,012 tons or 0.6 percent higher, and imports were 40,207 tons or 31.8 percent greater than in the same 7 months of 1961. Peru continued to lead other countries with shipments of 123,859 tons during the first 7 months of 1962--41,709 tons above the imports in the same period of 1961.

The total United States supply of fish meal in calendar year 1961 of 529,100 tons exceeded the peak year 1959 when the quantity amounted to almost 440,000 tons.

U. S. Supply of Fish Meal and Solubles, January-July 1961-62 and Total for 1961			
Item	January-July		Total
	1/1962	1961	1961
..... (Short Tons)			
Fish Meal and Scrap:			
Domestic production:			
Menahaden	141,012	141,359	247,551
Tuna and mackerel	11,617	11,378	21,243
Herring	1,839	3,283	5,268
Other	12,481	9,917	37,203
Total production	166,949	165,937	311,265
Imports:			
Canada	27,232	26,265	38,218
Peru	123,859	82,150	151,439
Chile	7,157	8,080	12,074
Angola	-	1,433	1,543
So. Africa Republic	7,984	7,716	13,026
Other Countries	511	892	1,545
Total imports	166,743	126,536	217,845
Available fish meal supply . . .	333,692	292,473	529,110
Fish Solubles:			
Domestic production 2/	72,534	62,789	112,241
Imports:			
Canada	1,006	699	1,001
So. Africa Republic	789	796	1,351
Other Countries	2,801	432	4,387
Total imports	4,596	1,927	6,739
Available fish solubles supply . . .	77,130	64,716	118,980
1/Preliminary.			
2/50-percent solids. Includes production of homogenized condensed fish.			

The United States supply of fish solubles (including homogenized fish) during January-July 1962 was 12,414 tons more than during the same period in 1961. Solubles and homogenized fish of 72,534 tons manufactured from domestically-caught fish made up 94 percent of the 7-months supply in 1962.

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FISH MEAL, OIL, AND SOLUBLES:

U. S. Production, August 1962: Preliminary data on U. S. production of fish meal, oil, and solubles for August 1962

U. S. Production 1/ of Fish Meal, Oil, and Solubles, August 1962 (Preliminary) with Comparisons				
Area	Meal Short Tons	Oil 1,000 Gallons	Solubles (Short Tons) . . .	Homogenized 3/
August 1962:				
East & Gulf Coasts	34,664	4,166	14,581	-
West Coast 2/	2,633	288	2,226	-
Total	37,297	4,454	16,807	-
Jan.-Aug. 1962 Tot.	207,942	22,248	38,223	6,570
Jan.-Aug. 1961 Tot.	223,474	26,120	73,777	8,697
1/ Does not include crab meal, shrimp meal, and liver oils.				
2/ Includes Hawaii, American Samoa, and Puerto Rico.				
3/ Includes condensed fish.				



At Moss Point, Miss., workers play heavy streams of water onto the fish in the hold of a menhaden vessel. This operation is necessary in order to make the menhaden flow into the stand-pipe and then through a discharge pump located on the dock of the fish reduction plant.

as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

* * * * *

U. S. Production, July 1962: During July 1962, 52,600 tons of fish meal and scrap and 6 million gallons of marine-animal oils were produced in the United States. Compared with July 1961, this was a decrease of



Chemist examining fish meal scrap in a fish reduction plant at Empire, La.

U.S. Production of Fish Meal, Oil, and Solubles, July 1962, with Comparisons

Product	July		Jan.-July		Total
	1/ 1962	1961	1/ 1962	1961	1961
Fish Meal and Scrap:	(Short Tons)				
Herring	1,013	1,424	1,839	3,283	5,268
Menhaden 2/	47,474	57,459	141,012	141,359	247,551
Sardine, Pacific	-	-	689	-	2,518
Tuna and mackerel	1,649	1,673	2/11,617	11,378	21,243
Unclassified	2,438	2,879	11,792	9,917	14,757
Total	52,574	63,435	166,949	165,937	291,337
Shellfish, marine-animal meal and scrap	3/	3/	3/	3/	19,928
Grand total meal and scrap	3/	3/	3/	3/	311,265
Fish solubles	20,965	20,342	64,469	56,894	100,551
Homogenized condensed fish	1,200	2,247	8,065	5,895	11,690
Oil, body:	(Gallons)				
Herring	219,457	189,827	333,657	406,757	818,017
Menhaden 2/	5,601,930	7,057,597	16,675,825	18,105,058	31,355,570
Sardine, Pacific	-	-	19,111	-	86,167
Tuna and mackerel	64,170	65,608	325,553	292,825	762,509
Other (including whale)	128,315	318,461	474,057	692,948	1,386,542
Total oil	6,013,872	7,631,493	17,828,200	19,497,588	34,408,805

^{1/}Preliminary data.^{2/}Includes a small quantity produced from thread herring.^{3/}Not available on a monthly basis.

10,900 tons or 17 percent in meal and scrap production and 1.6 million gallons or 21 percent in oil.

In July, menhaden meal amounted to 47,500 tons or 90 percent of the meal total and 5.6 million gallons of the oil production.

There were 21,000 tons of fish solubles produced in July 1962--600 tons above the same month of 1961. The production of homogenized condensed fish amounted to 1,200 tons--about 1,000 tons less than in July 1961.

During the first 7 months of 1962, meal and scrap production amounted to 166,900 tons--1,000 tons above the same period of 1961. The marine-animal oil yield totaled 17.8 million gallons--a drop of 1.7 million gallons.

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Major Indicators for U. S. Supply, August 1962: For the first eight months of 1962, fish meal and fish oil production was lower by 5.2 percent and 12.0 percent, respectively, as compared with the same period of 1961. Fish solubles production showed an increase of 8.0 percent.

Major Indicators for U. S. Supply of Fish Meal, Solubles, and Oil, August 1962					
Item and Period	1962	1961	1960	1959	1958
(Short Tons)					
Fish Meal:					
Production 1/:					
October	-	16,852	24,455	22,026	11,630
September	-	28,642	36,239	36,874	33,185
August	41,100	57,031	49,709	47,364	40,783
January-July	166,949	162,400	130,443	144,865	103,632
Jan.-Dec. prelim. totals 2/	-	289,039	257,968	275,396	216,510
Jan.-Dec. final tots.	-	311,265	290,137	306,551	248,140
Imports:					
October	-	9,425	12,515	3,821	5,899
September	-	13,941	9,487	9,224	5,079
August	-	19,026	8,340	5,695	5,310
July	25,857	18,710	13,131	4,303	13,546
January-June	140,886	107,826	66,375	101,421	55,946
January-December	-	217,846	131,561	132,925	100,352
Fish Solubles:					
Production 3/:					
October	-	8,459	7,192	12,487	8,867
September	-	11,232	12,573	23,979	23,049
August	16,700	19,685	16,921	29,785	24,653
January-July	72,534	62,969	55,822	89,051	58,415
Jan.-Dec. totals	-	112,241	98,929	165,359	130,177
Imports:					
October	-	110	-	1,908	2,548
September	-	263	38	1,732	253
August	-	318	180	4,718	2,819
July	306	708	96	4,938	607
January-June	4,290	1,219	2,518	9,073	2,293
Jan.-Dec. totals	-	6,739	3,174	26,630	14,567
Fish Body Oils:					
Production:					
October	-	1,901	3,024	2,176	1,139

(Table continued on following page)

Major Indicators for U. S. Supply of Fish Meal, Solubles, and Oil, August 1962 (Contd.)					
Item and Period	1962	1961	1960	1959	1958
..... (1,000 Gallons)					
September	-	3,224	3,939	2,888	3,689
August	4,500	6,548	4,910	3,877	4,160
January-July 4/ .	17,828	18,815	12,572	12,318	9,620
Jan.-Dec. prelim. totals	-	33,471	26,690	24,418	21,625
Jan.-Dec. final tots.	-	34,416	27,886	24,978	22,028
Exports:					
October	-	2,027	591	1,911	3,591
September	-	1,269	1,861	1,129	665
August	-	1,774	186	2,449	752
July	17	589	5,414	3,770	791
January-June	8,401	9,084	7,043	6,581	4,320
Jan.-Dec. totals	-	16,331	19,154	19,264	12,539

1/Does not include crab meat, shrimp and misc. meals.

2/Preliminary data computed from monthly data. Fish meal production reported currently comprised 86 percent of the annual total for 1958, 90 percent for 1959, 89 percent for 1960, and 92 percent for 1961.

3/Includes herring meal and fish oil.

4/Preliminary data computed from monthly data. Represents over 95 percent of the total production.

Note: Data for 1962 and 1961 are preliminary.



Irradiation Preservation

IRRADIATED CLAM MEATS TESTED FOR QUALITY IMPROVEMENT AFTER REFRIGERATION:

A series of sensory tests to determine if refrigeration of clam meats during irradiation results in a detectable improvement in quality was conducted by the U. S. Bureau of Commercial Fisheries Technological Laboratory at Gloucester, Mass. Initially, the vitamin content of clams sampled during the spawning season was determined by using a part of a sample which was irradiated at 350,000 rads ^{1/} and stored for 30 days at 33° F. The experiment showed no significant difference in quality after that period of storage.

^{1/Rad = The quantity of ionizing radiation which results in the absorption of 100 ergs per gram of irradiated material at the point of interest. Erg = unit of energy.}

Note: See *Commercial Fisheries Review*, April 1962 p. 24.



Michigan

NATURAL LAKE TROUT

REPRODUCTION PROJECT COMPLETED:

A community conservation project which may set the stage for natural lake trout reproduction in Higgins Lake, Roscommon County, Mich., was completed early in August 1962, the State of Michigan Conservation Department reports.

The project is a new spawning reef for lake trout located about one mile out from the lake's west shore. The reef measures about half the length and twice the width of a football field in an area where the fish are known to concentrate during the fall spawning season.

Selection of the project site was also pinpointed by Michigan Conservation Department studies which showed the area is free of siltation, and has suitable water temperatures and currents for egg hatching.

Some 200 yards of broken concrete were hauled on barges and dumped in the area by Michigan Conservation Department fisheries workers to create the artificial spawning bar.

Lake trout are expected to place their spawn in crevices of concrete chunks where the eggs will be protected from predation by perch and mud puppies.

A skin-diving fisheries biologist will check the reef for eggs in early November during the fall spawning season. Plans also call for placing some boxes of lake trout eggs in the area to study hatching results.



Mullet

DEVELOPMENT OF NEW PRODUCTS:

Experiments towards finding new uses for mullet were conducted this summer by the U. S. Bureau of Commercial Fisheries Technological Laboratory at Pascagoula, Miss., in a joint program with the Florida Conservation Department.

Butterfly mullet fillets cut from 500 pounds of fish were canned in brine at the Laboratory. The canned product was to go to Florida State institutions for consumer taste-testing. If the canned mullet is acceptable to Florida's State institutions along the Gulf and South Atlantic Coasts, it is believed that a new market could be developed for a large amount of unutilized fish.

Another 100 pounds of dressed mullet was shipped from Pascagoula to the Fishing Corporation's Research Department in Chicago in a joint program to use mullet in a smoked fish sausage. A meat packer in the Pascagoula area has agreed to try a consumer market test on the new product.



Navigable Waters

DUMPING ILLEGAL:

The dumping of petroleum products, garbage, and other refuse into the navigable waters of the United States with resulting pollution is of common concern to everyone.

The laws of the United States, Section 13 of the River and Harbor Act of 3 March 1899 (33 USC 407), make it unlawful to discharge, or suffer, cause, or permit the discharge of petroleum products, garbage, or other refuse matter of any kind or description into the navigable waters of the United States. This includes placement on shore or in tributaries so as to be washed into navigable waters; refuse thrown from shore is also included. Every person and every corporation that shall violate, or that shall knowingly aid, abet, authorize, or instigate a violation of this provision shall be guilty of a misdemeanor. Conviction carries a fine not exceeding \$2,500 nor less than \$500, or imprisonment for not less than 30 days nor more than one year, or by both such fine and imprisonment, in the discretion of the court. One-half of said fine is to be paid to the person or persons giving information which shall lead to conviction (Federal employees are not to benefit).

Section 16 of the River and Harbor Act of 3 March 1899 (33 USC 412) states that any boat, vessel, scow, raft, or other craft used or employed in violating any of the provisions listed above shall be liable for the pecuniary penalties specified above and in addition thereto for the damages done by said boat, vessel, scow, raft, or other craft, which latter sum shall be placed to the credit of the appropriation for the improvement of the harbor or waterway in which the damage occurred, and said boat, vessel, scow, raft, or other craft may be proceeded against summarily by way of libel in any district court of the United States having jurisdiction thereof.



Oceanography

COAST AND GEODETIC SURVEY TO PARTICIPATE IN INTERNATIONAL INDIAN OCEAN EXPEDITION:

Plans were announced in August by the U. S. Coast and Geodetic Survey for its vessel Pioneer to participate in the International Indian Ocean Expedition. The program has been planned to cover areas where little has been done to date, and to supplement work of the other expeditions. The Pioneer is scheduled to sail in mid-February 1964 from San Francisco, Calif., and will return to San Francisco the following September. In addition to under way observations en route to and from the Indian Ocean, the Pioneer will concentrate on gravity, magnetic, and hydrographic operations in the Andaman Sea and in the eastern Bay of Bengal.

Three north-south profiles of oceanographic stations are planned from 5° N. to 5° S. across the Equator south of the Bay of Bengal. Between San Francisco and Honolulu the Pioneer will carry out track-line hydrographic, gravity, and magnetic observations for coverage between the West Coast

and 155° W. Under way observations will include bathythermograph, surface salinity, and temperature, surface weather and upper air observations, visual observations of sea, swell, marine life, etc. Also included will be such under way biological observations as may be programmed by the biologists. From Honolulu to Guam, under way observations will continue along a track planned to cover a route not previously crossed for such observations. The Pioneer will make three crossings over the Marianas Trench. A similar program will be carried out with three crossings of the Phillipine Trench northeast of Samar. Under way observations will be continued to Manila. From Manila to Singapore, under way operations will continue with one long oblique crossing of the Palauw-North Borneo Trench.

From Singapore, the track will be northwest through the Malacca Straits into the Andaman Sea. Sediment cores and bottom photographs will be taken in the Andaman Sea. At the northern end of the Andaman Sea, special lines will be run to determine if submarine channeling extends seaward of the mouths of the Irrawaddi River.

From the Andaman Sea, the ship will pass into the Bay of Bengal where the under way operations, cores (or dredgings), and bottom photography will continue along a series of east-west lines from the coast of Burma out to approximately 88° E.

Special care will be taken along the more northerly of those lines to look for any southward extension of the Ganges Canyon. The Pioneer will carry out a detailed survey of the Ganges Canyon seaward of the continental shelf, which will be traced as far seaward as possible. Cores will be obtained from the canyon floor, where possible, and attempts will be made to dredge the canyon walls. At the termination of this project the ship will proceed to Trincomalle, Ceylon.

When the Pioneer leaves Trincomalle, a supposedly existing canyon will be traced seaward with a set of profiles and an attempt will be made to dredge the walls. Upon completion of the Canyon Survey, three north-south sections of oceanographic stations will be occupied from 5° N. to 5° S. along 84° E., 88° E., and 92° E. The track to Djarkarta is tentatively planned to accomplish two crossings of the northeastward extension of the trend of the Java Trench.

From Djkarta, under way observations will be carried out through the Java Sea, Macassar Strait, Celebes Sea, and from there to the Palau Islands. Under way observations will be continued to Guam. From Guam, three more crossings would be made of the Marianas Trench, and then to Honolulu along a line parallel to the track run on the way out. From Honolulu to San Francisco the track would be along one of the predetermined routes.

These preliminary plans are only tentative and may change as biologists and meteorologists' ideas take shape, and results of other ships operating in the Eastern Indian Ocean become available. (National Oceanographic Data Center Newsletter, August 15, 1962.)

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OCEANOGRAPHIC PROGRAM DEVELOPED BY DUKE UNIVERSITY:

Recent developments in the Biological Oceanography Program of Duke University's Marine Laboratory (located at Beaufort, N.C.) were announced in August. Much of the data collected under the program are to be given to the National Oceanographic Data Center, Washington, D. C. The laboratory's area of operations is likely to extend from Beaufort, N. C., south to Florida, and north to Virginia. Going eastward, the laboratory will probably concentrate its investigations in the Gulf Stream and the Sargasso Sea. The majority of the work scheduled in the program will be on shallow-water processes along the continental shelf, but some work will be done in deep water off Cape Hatteras.

The work to be undertaken will involve hydrographic observations, submarine geology, fisheries studies, and basic marine biological studies at sea. Those are the major aspects of the study programmed by Duke University, and also by various universities and laboratories involved in the Cooperative Ship Program.

As it now stands, the program has three major phases: (1) Cooperative Ship Program as a means of reaching the research goals of the cooperating agencies and institutions; (2) teaching of oceanography; and (3) graduate research in oceanography. (National Oceanographic Data Center Newsletter, August 15, 1962.)



Oregon

EFFECTS OF SEISMIC EXPLOSIONS ON MARINE LIFE PROBED:

Seismic explosions detonated by oil exploration crews operating off the Oregon coasts were charged to be seriously damaging fish, shellfish, and other marine life. The charges were to be probed in an investigation scheduled for September 6-7, 1962, by the Oregon Fish Commission. Oregon's water resources analyst for the State fisheries agency stated the initial biological experiment would be conducted off Astoria on September 6. That phase of the investigation was to determine if appreciable damage was being done to such species as sole, flounder, and Pacific ocean perch, which comprise a high percentage of Oregon's important trawl fishery landings.

A chartered Astoria trawler, the Betty, accompanied by the Shell Oil Company seismic boat Miss Ida, and an observer boat, were to move into an area between the Columbia lightship and Cape Falcon, in waters from 20 to 50 fathoms. When fish were located with fish-detection equipment, the trawler was to make two 1-hour tows, the second following as closely as possible the course of the first tow. At the end of the second tow, the seismic boat would begin detonating a series of charges suspended 3 to 5 feet beneath the surface along the same track, spacing the blasts at $\frac{1}{4}$ -mile intervals. The powder charges were to be the same as those used in routine seismic work--5-pound charges in water up to 200 feet in depth, and $16\frac{2}{3}$ pounds in water deeper than 200 feet. The trawler would again lay down fishing gear and follow closely behind the shot boat in an effort to determine if there were any change in abundance of fish. A second post-blast tow would be made back along the shot line in an attempt to pick up possible fish kills sinking to the bottom.

Catches were to be analyzed closely for species composition, size composition, total poundage, and for dead or injured fish. The catches were to be retained aboard the trawler and later marketed in the regular manner by the fisherman. Filleting operations were to be observed by Oregon Fish Commission biologists for signs of damage to individual fish attributed to the seismic explosions.

Expenses for the biological investigation are to be paid by the oil companies engaged in seismic operations.

In another phase of the project, Dungeness crabs of various sizes held in commercial crab pots in waters off Newport were to be subjected to typical seismic explosions. Half of the experimental pots would be pulled for examination immediately following the explosions, while others would be left for 72 hours to determine if there was any delayed mortality. Crabs held in pots not subjected to explosions were to be compared with experimental animals. The Oregon State Police were to provide a boat and crew to assist Oregon Fish Commission biologists in conducting that phase of the investigation.

SCUBA divers from both the Washington Department of Fisheries and Oregon Fish Commission were to make underwater observations during the two phases of the study.



Oysters

LONG ISLAND SOUND OBSERVATIONS ON SPAWNING AND SETTING AS OF AUGUST 17:

Setting of Starfish: Observations showed that setting of starfish continued from the latter part of July through the middle of August 1962, reports the U. S. Bureau of Commercial Fisheries Biological Laboratory, Milford, Conn. With the exception of the Bridgeport area, setting remained very light, especially in New Haven Harbor where virtually none occurred during that period.

Setting of Oysters: Examination of plankton samples collected on July 30 showed an almost complete absence of bivalve larvae. The situation had improved somewhat by August 2 when only two early umbo oyster larvae were found. On August 6 a small number of young oyster larvae was found at 3 stations and at a recently established station, but none was found at another station. The majority of the larvae was less than 150 microns long.

Samples collected on August 13 contained a few oyster larvae at 4 stations, but none at another station. The majority of the larvae was less than 200 microns long except for several that were somewhat larger, and up to 290 microns long. The larger larvae were found at stations established in Lewis Gut.

Plankton samples collected on August 16 indicated irregular distribution of larvae.

But since a comparatively large number of mature larvae was found at the New Haven and Bridgeport stations, an increase in intensity of setting may develop in the vicinity of those two points. It is also possible that the small patches of oyster larvae found at 2 stations may be carried by currents for some distances before they set.

Setting of oysters began July 18, but was largely confined to 3 stations in the New Haven area. That wave of setting continued until about July 29 and then ended, without spreading to other areas, especially Bridgeport. With the exception of a single spat recorded from time to time on some collectors, virtually no setting of oysters occurred at any of the stations from the latter part of July to the middle of August.

An auxiliary station was recently established in the Bridgeport area at the point where 4 lots join. The new auxiliary station serves as the control for the stations established in Lewis Gut, which had been chemically treated, and also because several oyster companies planted shells in that area. (Bulletin No. 3, August 17, 1962, issued by the Milford Biological Laboratory.)

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LONG ISLAND SOUND OBSERVATIONS ON SPAWNING AND SETTING AS OF AUGUST 27:

Setting of Oysters: As reported earlier in August 1962, the first wave of oyster setting, confined largely to the New Haven stations, continued until about July 29 and then virtually ceased. However, the presence of a comparatively large number of mature larvae, found around August 16 at a station in New Haven and one in Bridgeport, indicated a second wave of setting, reports the U. S. Bureau of Commercial Fisheries Biological Laboratory, Milford, Conn. This proved to be correct and on August 17 oysters began to set in shallow stations in Milford and 2 stations in the New Haven area. The Bridgeport stations showed a light set until about August 22 when a good number of recently-set oysters were found on the collectors from a Bridgeport station.

At one station located near Lighthouse Point in New Haven Harbor, the second wave of setting had been comparatively light but continued, while at a recently-established station in Bridgeport oysters set rather heavily on August 23. Judging that the majority of recently-set oysters found on the collectors on August 23 were less than one day old, setting was expected to continue for several days. This is especially true of 2 stations in the Bridgeport area.

Setting of Starfish: Contrary to the increase in intensity of setting of oysters, starfish setting remained light throughout the oyster-producing area, especially at the shallow stations of Milford and all stations of the New Haven area.

Development of Method for Chemical Control of Oyster Enemies: Continuing observations under natural conditions on the effectiveness of the Milford method upon



Biologists of U. S. Bureau of Commercial Fisheries Biological Laboratory, Milford, Conn., spraying a chemical over oyster drill-infested bed.

boring gastropods, an experiment was conducted in cooperation with the Northern Oyster Company, Inc., at Fireplace, Long Island, where ten acres of oyster bottom heavily infested with drills were covered on August 10 at the rate of 3.5 yards of chemically-treated sand per acre. After the treatment, a trap line (with 10 traps baited with mussels) was placed across the treated area and an identical line was placed on the untreated section. One week after the treatment the trap lines were fished and examined. The examination indicated that over 90 percent of the drills on the treated area were killed. A week later examination of the traps gave only 6 drills and no starfish, while the traps from the control area contained 306 drills and 74 starfish. Thus, 2 weeks after treatment the population of drills on the treated area was reduced by approximately 98 percent.

In connection with this experiment it should be emphasized that the Fireplace oyster bed, located near the tip of Long Island, lies virtually in the open ocean at a considerable depth. Thus, treatment of such an area presented many difficulties, nevertheless, it apparently has been a success. Properly trained employees of the Northern Oyster Company, Inc., will continue trap studies as long as necessary.

Observations in Lewis Gut, Bridgeport, which was treated earlier in the season, indicate that drills are still virtually absent.

In trying various anti-drill compounds last year, two experimental lots in New Haven Harbor were treated with different quantities of a crystalline material, paradichlorobenzene. The treatment reduced the drill population but not as effectively as the mixture of sand, Polystream and Sevin. At present, tests are being made to determine whether the addition of Sevin to crystals of paradichlorobenzene increases its effectiveness against drills. Laboratory experiments conducted so far indicate that when Sevin is added to paradichlorobenzene the drills are affected more quickly and more severely. This experiment will continue and may develop into another modification of the basic method developed by the Laboratory. (Bulletin No. 4, August 27, 1962.)

* * * * *

FUNGUS PARASITE THAT KILLS OYSTERS TO BE STUDIED:

Research on a fungus parasite that is killing oysters in the Gulf of Mexico and South Atlantic is to be conducted by a marine biologist of the Texas Agricultural and Mining College.

The marine biologist will investigate the effects of antibiotics on fungus parasites in oysters with the help of a \$5,175 grant from the National Institutes of Health. He is an assistant professor of oceanography at Texas A & M College, and will conduct his research at the College's Marine Laboratory at Fort Crockett, Galveston.

The fungus parasite (*Dermocystidium marinum*) is the cause of considerable mortality to oysters in warm seasons in relatively high salinity ocean areas, the researcher said. Oyster beds are being depleted drastically and the industry is failing.

The biologist doing the research will conduct physiological and nutritional studies of oysters under laboratory conditions. All commercially available antifungal antibiotics will be tested for effects on the oyster fungus parasite. (Science News Letter, September 1, 1962.)



Shrimp

RESEARCH PROGRAM EXPANDED:

The Gulf of Mexico shrimp research program of the U. S. Bureau of Commercial Fisheries will be expanded this year because of the additional funds voted by the United States Congress. The sharp drop in landings of shrimp from the Gulf of Mexico in 1961, because of unknown natural factors, emphasized the need for more knowledge about the causes of fluctuation in this important marine resource. Commercial landings by Gulf fishermen in 1961 were little more than half the amount expected normally. With the addition of \$325,000 this year, the Bureau's biological research program, aimed at ultimately developing a method of predicting the seasonal abundance of shrimp and better management of this valuable resource, will reach a level of \$750,000 annually.

Another \$100,000 has been added to studies of fishing gear improvement in the hope of reducing costs through more efficient shrimp fishing. A considerable amount of research has been done along this line, but it needs to be accelerated, because of the constantly increasing pressure of competition of foreign fishery products in the United States markets. Price is one of the competitive factors, and under normal producing conditions United

States fishermen must seize every opportunity to hold a favorable position.

Because of the wide-spread interest in shrimp research by all of the States bordering the Gulf of Mexico, the Gulf States Marine Fisheries Commission sponsored a joint meeting between Federal representatives and State research men early in September to work out final details of the expanded shrimp research program.

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UNITED STATES SHRIMP SUPPLY INDICATORS, AUGUST 1962:

Item and Period	1962	1961	1960	1959	1958
..... (1,000 Lbs., Heads-Off)					
Total Landings, So. Atl. and Gulf States:					
October	-	12,696	21,690	19,601	16,462
September	-	9,691	18,832	18,331	15,847
August	11,200	10,944	20,441	18,595	14,173
January-July	44,200	41,530	58,521	53,004	49,555
January-December	-	91,395	141,035	130,660	116,552
Quantity canned, Gulf States 1/:					
October	-	2,307	2,567	2,531	3,489
September	-	785	2,236	2,108	2,825
August	1,400	1,206	5,041	2,427	2,809
January-July	11,600	8,447	16,159	14,023	11,914
January-December	-	15,760	28,594	24,679	26,404
Frozen inventories (as of end of each mo.) 2/:					
October 31	-	17,811	31,209	33,057	24,620
September 30	-	13,361	26,119	18,079	16,896
August 31	4/	12,728	20,171	23,780	15,274
July 31	13,677	14,849	17,397	22,357	12,351
June 30	13,796	19,416	15,338	19,283	10,664
May 31	13,904	24,696	17,540	21,137	11,013
January 31	-	31,842	34,332	30,858	17,983
Imports 3/:					
October	-	16,831	14,211	15,340	11,463
September	-	8,629	8,190	7,541	7,620
August	4/	6,743	6,407	5,107	6,628
July	8,265	6,635	7,319	7,861	6,340
January-June	64,001	57,168	51,365	49,826	32,278
January-December	-	126,268	115,418	106,355	85,393

1/Pounds of headless shrimp determined by multiplying the number of standard cases by 35.
2/Raw headless only; excludes breaded, peeled and deveined, etc.
3/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of Census.

4/Not available.

Note: Data for 1962 and 1961 are preliminary. August 1962 data estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.



South Atlantic Exploratory

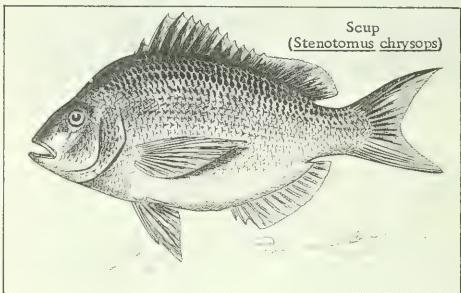
Fishery Program

ANIMAL LIFE EXPLORATIONS OFF NORTH CAROLINA COAST:

M/V "Silver Bay" Cruise 40: To assess the animal life in Onslow Bay off the North Carolina coast, an 18-day trip was made by the exploratory fishing vessel Silver Bay of the U. S. Bureau of Commercial Fisheries.

The vessel returned to its base at Brunswick, Ga., on August 6, 1962.

Approximately 425 miles of "searching" transects were made between Capes Lookout and Fear. Most fishing was done with 70/90- and 80/100-foot roller-rigged nylon fish trawls. An arrowhead fish trap and hand lines were also used, and the white-line depth-recorder was used for fish detection.

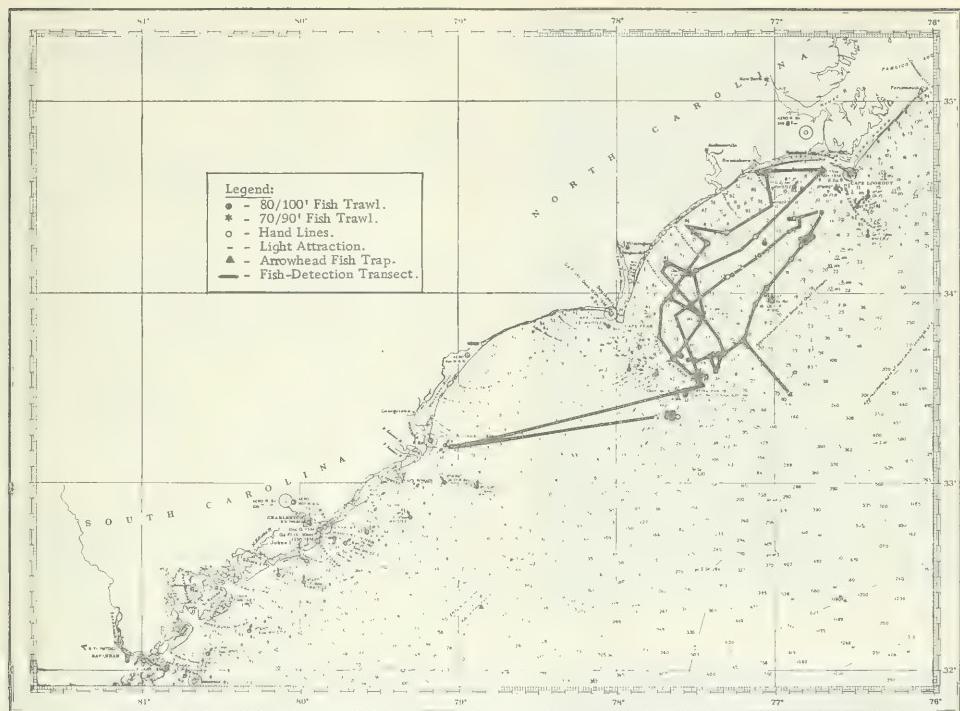


Extensive areas of slab rock caused some gear damage even though much of the sea bottom appeared trawlable on the depth recorder. Total catches ranged up to 2,300 pounds per 90-minute drag. Scup (Stenotomus chrysops) were the dominant species, ranging up to 1,500 pounds per drag.

Small amounts of spot-tail pinfish (Diplodus holbrookii), up to 250 pounds per drag, were caught throughout the area in nearly every drag. Most scup averaged three fish to the pound and the spot-tail pinfish averaged one pound each. Over broken bottom areas, catches of vermilion snapper (Rhomboptilus aurubens) ranged up to 600 pounds per drag.

Red snapper (Lutjanus blackfordi) up to 68 pounds per drag, and grouper (Myctero-perca sp.) up to 30 pounds per drag were caught in trawls, traps, and by hand lines. Extensive fish tracings of large concentrations of midwater and near-bottom fish were recorded throughout Onslow Bay. These were believed to be scad (Decapterus sp.) with catches in large-mesh fish trawls of up to 900 pounds per drag.

It appeared at that time of year that fish species (primarily scup) commonly found north of Cape Lookout inhabit the inshore area of Onslow Bay. Snapper and grouper, which are commonly found south



Onslow Bay explorations off the North Carolina coast by M/V Silver Bay Cruise 40 (July 19-August 6, 1962).

of Cape Fear, were found also in the off-shore area of Onslow Bay. The area beyond the 20-fathoms depth is still unexplored.



United States Fisheries

COMMERCIAL FISHERY LANDINGS, JANUARY-JULY 1962:

Total Landings: Landings of fish and shellfish in the United States during the first 7 months of 1962 were 5 percent less than during the same period of 1961. The decline was due largely to a sharp drop in menhaden landings.

Menhaden: Total landings for the first 8 months of 1962 amounted to 1.6 billion pounds--177 million pounds less than for the same period in 1961. The catch was off sharply in the New England, Middle Atlantic, and Gulf States.

Salmon: On the basis of the reported pack of canned salmon, it was estimated that the Alaska catch for the 1962 season totaled approximately 272 million pounds--a gain of 7 million pounds compared with the 1961 season.

Shrimp: The South Atlantic and Gulf States landings through August 1962 amounted to about 93 million pounds, an increase of 5 million pounds as compared with the same period in 1961.



Fig. 1 - Scene inside a crab plant in Biloxi, Miss. Some plants use rotary washers for cleaning the debacked crabs.



Fig. 2 - At an industrial fishery products plant in Moss Point, Miss., raw menhaden are being carried on a belt into the plant. Fish are carried either directly to a cooker or to temporary storage in raw box.



Fig. 3 - Oyster shucker in a New Orleans oyster plant. Shucker cuts muscle holding the top shell of the oyster, after biling oyster with hammer.

United States Commercial Fishery Landings of Certain Species for Periods Shown, 1962 and 1961				
Species	Period	1/1962	1961	Total 1961
Anchovies, Calif., . . .	7 mos.	.....	(1,000 lbs.)	
Cod:				
Maine	6 mos.	1,400	1,507	2,507
Boston	7 "	14,500	13,226	18,837
Gloucester	7 "	2,000	1,615	3,358
Total cod		17,900	16,348	24,702
Haddock:				
Maine	6 mos.	900	1,299	2,940
Boston	7 "	53,800	52,297	84,093
Gloucester	7 "	10,200	9,033	15,025
Total haddock		64,900	62,629	102,058
Halibut 2/:				
Alaska	7 mos.	21,500	18,831	25,077
Wash. & Oreg.	7 "	8,400	10,782	14,947
Total halibut		29,900	29,623	40,024
Herring, Maine	7 mos.	58,800	11,699	54,463
Industrial Fish, Me., & Mass. 3/	7 mos.	24,300	22,521	41,851
Mackerel:				
Jack	7 mos.	41,200	29,824	102,958
Pacific	7 "	19,300	20,628	38,428
Menhaden	8 mos.	1,614,400	1,791,059	2,308,000
Ocean Perch:				
Maine	6 mos.	36,800	39,887	77,350
Boston	7 "	400	320	701
Gloucester	7 "	38,700	34,946	53,991
Total ocean perch		75,900	75,153	132,042
Salmon, Alaska	Year	272,000	264,814	264,814
Sardine, Pacific	to Sept. 6	12,000	8,801	43,169
Scallops, sea, New Bedford (meats)	7 mos.	12,100	11,851	20,648
Shrimp (heads-on):				
So. Atl. & Gulf	8 mos.	93,100	88,156	153,500
Washington	7 "	800	951	1,459
Squid, Calif.	7 "	6,900	1,064	5,400
Tuna, Calif.	8 "	208,400	225,214	307,263
Whiting:				
Maine	6 mos.	4,500	2,279	14,147
Boston	7 "	100	63	144
Gloucester	7 "	21,700	24,286	51,598
Total whiting		26,300	26,638	65,889
Total all above items		2,579,500	2,689,533	3,713,168
Other 4/		367,000	408,637	1,441,832
Grand Total		2,946,500	3,098,170	5,155,000

1/Preliminary.

2/Excludes menhaden.

3/Includes landings for species not listed.

Note: Finfish generally converted to round weight, crustaceans to weight in the shell, and mollusks reported in meats only.

Tuna: Landings in California (including transshipments of United States-caught fish from South America) amounted to about 208 million pounds through August 1962--17 million pounds less than for the same period in the previous year.

Maine Herring: Landings through July of this year (58.8 million pounds) were up 47 million pounds--a sharp increase over the same period of 1961. The 28 million pounds caught in July almost doubled the amount taken in the first half of the year.



U. S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED, AUGUST 1962:

During August 1962, a total of 42 vessels of 5 net tons and over were issued first documents as fishing craft, as compared with 41 in August 1961. There were 22 documents cancelled for fishing vessels in August 1962 as compared with 26 in August 1961.

Table 1-U.S. Fishing Vessels 1/—Documentations Issued and Cancelled, by Areas, August 1962 with Comparisons

Area (Home Port)	Aug.		Jan.-Aug.		Total 1962 1961
	1962	1961	1962	1961	
.....(Number).....					
Issued first documents 2/:					
New England	2	5	22	26	33
Middle Atlantic	-	4	2	9	12
Chesapeake	3	2	26	43	75
South Atlantic	10	5	31	34	47
Gulf	16	10	78	83	100
Pacific	10	13	110	137	149
Great Lakes	1	2	2	11	12
Puerto Rico	-	-	-	2	2
Total	42	41	271	345	430
Removed from documentation 3/:					
New England	2	2	14	13	20
Middle Atlantic	2	1	28	19	34
Chesapeake	4	5	17	26	28
South Atlantic	3	1	25	19	30
Gulf	2	10	71	70	103
Pacific	6	3	78	63	112
Great Lakes	3	4	15	12	14
Hawaii	-	-	3	-	-
Puerto Rico	-	-	1	-	-
Total	22	26	252	222	341

1/For explanation of footnotes, see table 2.

Table 2-U.S. Fishing Vessels—Documents Issued and Cancelled, by Tonnage Groups, August 1962

Gross Tonnage	Issued 2/	Cancelled 3/	.....(Number).....
5-9	6	7	
10-19	10	5	
20-29	6	2	
30-39	10	1	
40-49	1	-	
50-59	3	1	
60-69	2	1	
70-79	4	1	
80-89	-	1	
90-99	-	1	
110-119	-	1	
140-149	-	1	
Total	42	22	

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2/Includes redocumented vessels previously removed from records. Vessels issued first documents as fishing craft were built: 30 in 1962, 2 in 1961, 8 prior to 1951, and 2 unknown. Assigned to states on the basis of their home ports.

3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.

Sources: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.



U.S. Foreign Trade

EDIBLE FISHERY PRODUCTS, JUNE 1962:

Imports of fresh, frozen, and processed edible fish and shellfish into the United States in June 1962 were down 29.7 percent in quantity and 8.2 percent in value as compared with the previous month. The quantity dropped more than the value because lower-priced imports declined more than higher-priced imports. Imports were down in June for fish blocks or slabs (decline mostly from Iceland), groundfish fillets other than ocean perch (decline mostly from Iceland), swordfish fillets, sea catfish fillets (decline mostly from Iceland), canned salmon (from Japan), frozen tuna (decline mostly from Japan, British West Africa, and Ecuador), canned sardines in oil (decline mostly from Norway and Denmark), canned crab meat (from Japan), canned lobster meat (from Canada), frozen shrimp (decline mostly from Mexico), and sea scallops (from Canada). The declines were partly offset by a gain in imports of ocean perch fillets (mostly from Canada), flounder fillets (mostly from Canada), halibut and salmon fillets (mostly from Canada), yellow pike fillets (from Canada), fresh and frozen salmon (mostly from Canada), canned tuna in brine other than albacore (mostly from Japan), frozen spiny lobster tails (increase mostly from Australia), canned oysters (mostly from Japan), and frozen frog legs (mostly from Japan).

Compared with the same month in 1961, the imports in June 1962 were up 1.1 percent in quantity and 16.5 percent in value. Imports were up this June for canned salmon (from Canada and Japan), canned tuna in brine (mostly from Japan), canned sardines in oil, canned sardines not in oil (mostly from South Africa), canned crab meat (mostly from Japan), frozen spiny lobster tails (increase mostly from Australia), frozen shrimp, and sea scallops (mostly from Canada). But imports were down for fish blocks or slabs, groundfish fillets other than haddock fillets, flounder fillets (mostly from Canada), sea catfish fillets, fresh and frozen salmon (mostly from Canada), frozen tuna, and canned oysters (mostly from Japan).

In the first six months of 1962, imports were up 14.6 percent in quantity and 23.3 percent in value as compared to the same period in 1961. The greater increase in value was because of the higher prices which prevailed in the first part of this year for nearly all imported fishery products. Most fishery products were imported in greater quantity this year and imports were up substantially for fish blocks or slabs, canned salmon (mostly from Canada and Japan), frozen tuna (increase mostly from Japan, Peru, and British West Africa), canned tuna (mostly from Japan), canned sardines in oil, canned sardines not in oil, frozen shrimp, and sea scallops. Imports were down for the following products: cod fillets, haddock fillets, fresh and frozen salmon (mostly from Canada), canned bonito and yellowtail, canned oysters (mostly from Japan), and frozen frog legs. The increase in canned sardines in oil reflects the small Maine pack for the 1961 season.

U. S. Imports and Exports of Edible Fishery Products, June 1962 with Comparisons

Item	Quantity		Value	
	June 1962	Jan.-June 1961	June 1962	Jan.-June 1961
(Millions of Lbs.) . . . (Millions of \$) . . .				
Imports:				
Fish & Shellfish:				
Fresh, frozen, & processed 1/ . . .	84.1	83.2	559.9	488.4
Exports:				
Fish & Shellfish:				
Processed only 1/ & frozen . . .	3.2	1.2	17.4	12.9

1/Includes pastes, sauces, clam chowder and juice, and other specialties.

United States exports of processed fish and shellfish in June 1962 were up 166.7 percent in quantity and only 25.0 percent in value as compared with June 1961. Exports of the lower-priced canned sardines not in oil and canned squid (to Greece and the Philippines) were much higher this June. There was some increase in exports of canned mackerel, canned salmon, and canned sardines in oil. But exports of the higher-priced canned shrimp (principally to Canada and the United Kingdom) were down.

Compared with the previous month, the exports in June 1962 were up 52.4 percent in quantity, and 42.9 percent in value. Exports were up for canned mackerel, canned salmon, canned sardines in oil, canned shrimp (principally to Canada and the United Kingdom), and canned squid (to Greece and the Philippines). There was a modest decline in exports of canned sardines not in oil.

Processed fish and shellfish exports for the first six months of 1962 were up 34.9 percent in quantity, but the value was up only 4.5 percent as compared with the same period of 1961. The following were exported in substantially greater quantities in 1962: canned mackerel and canned squid (to Greece and the Philippines). Exports were slightly higher for canned salmon and canned sardines not in oil. But exports were down for canned shrimp (principally to Canada and the United Kingdom) and canned sardines in oil. Since most of the increase in exports January-June this year was in the lower-priced products, the value did not increase at the same rate as the quantity.

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IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-September 1, 1962, amounted to 37,272,804 pounds (about 1,774,895 std. cases), according to data compiled by the Bureau of Customs. This was 4.9 percent more than the 35,537,369 pounds (about 1,692,256 std. cases) imported during January 1-September 2, 1961.

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1962 at the 12½-percent rate of duty is limited to 59,059,014 pounds (about 2,812,000 std. cases of 48 7-oz. cans). Any imports in excess of the quota are dutiable at 25 percent ad valorem.

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AIRBORNE IMPORTS OF FISHERY PRODUCTS:

January-April 1962: Shrimp was the leading U. S. airborne fishery import during the first part of 1962. Shrimp accounted for 82.1 percent of the quantity and 83.1 percent of the value of airborne imports of fishery products in April 1962. All of the U. S. airborne shrimp imports during the first four months of 1962 originated in Central and South American countries. The leading suppliers of airborne shrimp imports during January-April 1962 were Venezuela with 40.9 percent of the total, Nicaragua with 28.5 percent of the total, and Panama with 18.1 percent of the

total. Mexico was the most important supplier of fishery products other than shrimp during January-April 1962. The data as issued do not show the state of the product-fresh, frozen, or canned, but it is believed that the bulk of these airborne imports is fresh and frozen products.

U. S. Airborne Imports of Fishery Products,
January-April 1962

Product and Origin 1/	April		Jan.-April	
	Qty. 2/	Value 3/	Qty. 2/	Value 3/
Fish:			Pounds	US\$
Canada	-	-	1,000	368
Mexico	25,142	6,759	153,062	26,076
France	-	-	155	463
Rumania	100	997	100	997
Panama	7,807	1,312	7,807	1,312
Total Fish	33,049	9,068	162,124	29,216
Shrimp:			Pounds	US\$
Guatemala	11,272	6,702	66,068	34,085
El Salvador	23,410	16,880	125,744	84,721
Nicaragua	77,535	29,174	603,543	201,611
Costa Rica	18,742	8,458	52,411	21,245
Panama	150,840	75,928	384,068	194,540
Venezuela	197,322	109,891	865,847	415,885
Ecuador	-	-	12,210	3,440
Mexico	-	-	6,072	3,850
Netherlands Antilles	3,075	2,722	3,075	2,722
Total Shrimp	482,196	249,755	2,119,038	962,109
Shellfish other than Shrimp:				
British Honduras	15,210	8,813	61,884	38,550
Honduras	4,590	850	60,203	47,706
Costa Rica	-	-	1,400	1,247
Panama	-	-	1,040	1,011
Jamaica	13,288	9,664	28,188	20,544
Netherlands Antilles	12,398	8,580	14,159	9,264
Venezuela	3,560	1,466	22,263	13,624
Mexico	16,067	9,161	27,793	16,050
Guatemala	-	-	2,370	1,880
Leeward and Wind- ward Islands	5,611	1,933	14,823	5,201
Nicaragua	-	-	390	281
Japan	-	-	26	330
France	70	212	150	419
Colombia	140	236	140	236
Ecuador	940	704	940	704
Total Shellfish (exc. shrimp)	71,874	41,619	235,769	157,047
Grand Total	587,119	300,442	2,516,931	1,148,372

1/Where the country of origin is not known, the country of shipment is shown.

2/Gross weight of shipments, including the weight of containers, wrappings, crates, and moisture content.

3/F.o.b. point of shipment. Does not include U. S. import duties, air freight, or insurance.

Note: These data are included in the over-all import figures for total imports; i.e., these imports are not to be added to other import data published.

Sources: United States Airborne General Imports of Merchandise, FT 320, April 1962, U. S. Department of Commerce.

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January-March 1962: United States airborne imports of fishery products during the first quarter of 1962 amounted to 1,929,812 pounds valued at \$847,930. Shrimp and prawns accounted for 84.8 percent of the quantity and 84.0 percent of the value of the

U. S. Airborne Imports of Fishery Products, January-March 1962		
Product and Origin 1/	January-March 1962 Quantity 2/	Value 3/ US\$
Fish:	Pounds	US\$
Canada	1,000	368
Mexico	127,920	19,317
France	155	463
Total Fish	129,075	20,148
Shrimp:		
Guatemala	54,796	27,383
El Salvador	102,334	67,841
Nicaragua	526,008	172,437
Costa Rica	33,659	12,787
Panama	233,228	118,612
Venezuela	668,525	306,004
Ecuador	12,210	3,440
Mexico	6,072	3,850
Total Shrimp	1,636,842	712,354
Shellfish other than Shrimp:		
British Honduras	46,674	29,737
Honduras	55,613	46,856
Costa Rica	1,400	1,247
Panama	1,040	1,011
Jamaica	14,900	10,880
Netherlands Antilles	1,761	684
Venezuela	18,703	12,158
Mexico	11,726	6,889
Guatemala	2,370	1,880
Leeward and Windward Islands	9,212	3,268
Nicaragua	390	281
Japan	26	330
France	80	207
Total Shellfish (exc. shrimp)	163,895	115,428
Grand Total	1,929,812	847,930

1/When the country of origin is not known, the country of shipment is shown.
2/Gross weight of shipments, including the weight of containers, wrappings, crates, and shipping case content.
3/F.o.b. point of shipment. Does not include U. S. import duties, air freight, or insurance.
Note: These data are included in the over-all import figures for total imports; i. e., these imports are not to be added to other import data published.
Source: United States Airborne General Imports of Merchandise, FT 380, January, February, and March 1962, U. S. Department of Commerce.

airborne imports in the first quarter of 1962. The leading suppliers of airborne imports of shrimp and prawns during the period were Venezuela with 40.8 percent of the total and Nicaragua with 32.1 percent of the total. The data as issued do not show the state of the product-fresh, frozen, or canned, but it is believed that the bulk of these airborne imports is fresh and frozen products.



Wholesale Prices

EDIBLE FISH AND SHELLFISH, AUGUST 1962:

The August 1962 wholesale price index for edible fishery products (fresh, frozen, and canned) at 121.6 percent of the 1957-59 base was up 2.2 percent from the previous month, and was also higher by 10.1 percent from August 1961. High-er wholesale prices for fresh large haddock, fresh halibut,



Fig. 1 - Hand-weighing shrimp in a cannery located in Biloxi, Miss.

and salmon, and fresh and frozen shrimp this August were mainly responsible for the increase over July, but prices for Maine canned sardines dropped sharply from July to Au-gust.

The fresh and frozen drawn, dressed, or whole finfish subgroup this August rose 6.7 percent from July. Prices this August were higher for all products in the subgroup, except for fresh Lake Superior drawn whitefish at Chicago (down 12.4 percent). Prices were higher at Boston for large ex-vessel haddock (up 11.4 percent), and at New York City for fresh dressed Pacific halibut (up 4.4 percent) and fresh dressed king salmon (up 7.7 percent). Great Lakes yellow pike at New York City was up 5.3 percent from July to August. Compared with the same month the previous year, the subgroup index this August was 15.4 percent higher. Substantially higher prices at New York City for fresh dressed halibut (up 23.8 percent) and at Boston for large ex-vessel haddock (up 11.1 percent), were offset only slightly by the lower prices for Lake Superior whitefish (down 17.9 per-cent) and yellow pike (down 9.1 percent).

Higher fresh shrimp prices at New York City (up 8.3 per-cent) were responsible for a 3.7-percent increase in the pro-cessed fish and shellfish subgroup index this August. The demand for shrimp was good and market conditions were even stronger despite some increase in seasonal South Atlan-tic shrimp landings. Prices for fresh haddock fillets at Bos-ton were down 5.2 percent from July to August because of



Fig. 2 - View in front of wholesaler's stand in the "old shed" of the salt-water section of Fulton Fish Market, New York City. Boxed fish ready for shipment.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, August 1962 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\\$)		Indexes 2/ (1957-59=100)				
			Aug. 1962	July 1962	Aug. 1962	July 1962	June 1962	Aug. 3/1961	
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					121.6	119.0	118.3	110.4	
Fresh & Frozen Fishery Products:									
Drawn, Dressed, or Whole Finfish:					124.3	118.5	117.5	109.4	
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.14	.13	131.6	123.3	114.3	114.0	
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.47	.45	109.8	98.6	59.5	98.8	
Salmon, King, lge. & med., drsd., fresh or froz.	New York	lb.	1.05	.98	138.9	130.0	130.1	112.4	
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.53	.60	146.7	136.2	134.5	122.2	
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.50	.48	81.9	77.8	73.7	90.1	
Processed, Fresh (Fish & Shellfish):									
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.37	.39	117.6	113.4	120.6	113.2	
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.98	.90	89.8	94.7	76.5	74.1	
Oysters, shucked, standards	Norfolk	gal.	7.50	7.50	114.3	105.5	121.9	101.4	
Processed, Frozen (Fish & Shellfish):									
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.39	117.8	113.3	112.7	97.4	
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.35	.34	100.1	98.9	96.3	97.6	
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.30	.30	101.1	98.2	96.7	95.2	
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	1.08	1.03	105.2	103.4	106.1	99.9	
Canned Fishery Products:									
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	28.50	28.50	117.4	120.1	120.1	112.5	
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	12.15	12.15	124.2	124.2	124.2	122.0	
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	5.25	5.25	107.9	107.9	107.9	97.7	
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	9.31	11.31	118.5	118.5	118.5	101.5	
1/Refer average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.									
2/Beginning with January 1962 indexes, the reference base of 1947-49=100 was superseded by the new reference base of 1957-59=100.									
3/Recomputed to be comparable to 1957-59=100 base indexes.									

heavier small haddock landings as compared to the substantially lower landings of large haddock. When compared with August 1961, the subgroup index this August was 3.9 percent higher because of increased prices for fresh haddock fillets (up 21.2 percent) and a 12.7 percent increase in fresh shrimp prices at New York City.

The price index for processed frozen fish and shellfish this August rose 4.0 percent from July and was up 20.9 percent from August 1961. From July to August, the market was stronger for frozen shrimp at Chicago (prices were up 4.8 percent) because of very low supplies, and those prices were up 32.5 percent from August 1961. In August, prices for frozen haddock fillets were up 3.0 percent, ocean perch fillets rose 1.7 percent, and flounder fillets were up 1.2 percent as com-

pared to the previous month. As compared with August 1961, prices for all fillets in the subgroup were higher.

Canned fishery products prices this August were unchanged for all items except canned Maine sardines. A 17.7-percent drop in canned Maine sardine prices from July to August was responsible for a 2.3-percent decline in the subgroup index. As of the end of August, the Maine sardine pack of about 1.5 million standard cases was about 3 times greater than the previous season's pack and prices were 9.7 percent lower than at the same time last year. Canned tuna stocks at the end of August 1962 were liberal, but prices were still 10.4 percent higher than a year earlier. Stocks of California sardines this August were about exhausted and prices for that product were 16.7 percent higher than in August 1961.





International

INTERNATIONAL PACIFIC HALIBUT COMMISSION

PACIFIC HALIBUT FISHING IN AREAS 2 AND 1 ENDED SEPTEMBER 8:

The International Pacific Halibut Commission on August 29 announced the closure of Area 2 and Area 1 to halibut fishing effective at 6:00 p.m. (P.S.T.) September 8, 1962. The Commission estimated that the 28-million-pound limit set for Area 2 would be caught by the closing date. Area 1, which has no catch limit, will also be closed on the same date as Area 2.

In 1961, when Area 1 consisted of two areas, the part designated Area 1B closed on the same date as Area 2, but the part designated Area 1A was open to fishing until October 1. Fishing in Area 3A ended on August 11, 1962. Fishing in Areas 1, 2, and 3A is ended until the areas are reopened in 1963. Area 1 includes the waters south of Willapa Bay, Wash.; Area 2, the waters between Willapa Bay and Cape Spencer, Alaska; Area 3A, the waters between Cape Spencer and the Shumagin Islands of the Alaska Peninsula.

The official opening date for all halibut fishing in the North Pacific regulatory area this year was May 9 at 6:00 p.m. (P.S.T.), except that fishing in Area 3B South started on April 19 and Area 3B North started on March 28.

Areas 2 and 1 this year were open to halibut fishing for 122 days. Areas 2 and 1B were open for 120 days in 1961, 91 days in 1960, 68 days in 1959, 59 days in 1958, 47 days in 1957, and 38 days in 1956. Before the "lay-over" provision was adopted in 1956, halibut seasons were shorter. The "lay-over" rule requires halibut vessels to remain in port for a specified rest period after each trip. The fishing season in Areas 2 and 1B was only 24 days in 1955, 21 days in 1954, and 24 days in 1953.

Fishing in Area 3B South was to continue until 6:00 p.m. (P.S.T.) September 30, 1962. Fishing in Area 3B North was to continue until 6:00 p.m. (P.S.T.) October 15, 1962. Area 3B South includes the waters west of Area 3A, not including the Bering Sea. Area 3B North includes the waters in the Bering Sea.

Note: See *Commercial Fisheries Review*, September 1962 p. 52.

INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION

FISHING PROBLEMS DISCUSSED AT INTERIM MEETING:

Top fisheries officials and experts of Canada, Japan, and the United States on August 22, 1962, concluded a week-long meeting in search of a solution of certain of their joint fishing problems in the northern North Pacific Ocean.

The main purpose of the special meeting, in which 27 persons took part, was to discuss expanding Japanese bottom-trawling

operations in areas of the eastern North Pacific where Canadian and United States fishermen fish for halibut with long lines. Although Japan, under the terms of a tri-partite fisheries treaty, abstains from taking halibut in the eastern Bering Sea and the eastern North Pacific, her fishermen trawl for other species of groundfish in those areas. Since halibut and other groundfish are usually found on the same grounds, a difficult situation has arisen.

Up to the present, Japanese bottom trawling operations in the Gulf of Alaska have been limited to small-scale exploratory operations. North of the Aleutian Islands, in the eastern Bering Sea, both Japanese and Soviet trawlers have developed large bottom-fishing operations. Their total catch in 1961 was approximately 1.5 billion pounds. Halibut apparently formed a very small proportion of that catch.

Entry of a sizable fleet of trawlers from the U.S.S.R., which is not a signatory to the North Pacific Treaty, into the Gulf of Alaska has increased the complexity of the problem and strengthened pressure in Japan for entry of their fleets into the Gulf.

Discussions at the meeting centered on the question of how Japan may exercise her right to fish for species of groundfish other than halibut in the Gulf of Alaska in a way which will minimize damage to the halibut stocks, which Japan has agreed to abstain from fishing. Although final conclusions were not reached at the meeting, spokesmen for all the member countries expressed satisfaction at the degree of understanding of each others' problems which was achieved. It is believed that information developed at the meeting will enable the Commission to resolve the joint problems at its 1962 Annual Meeting, which will be held in Seattle, Wash., in November 1962.

An expert from the International Pacific Halibut Commission took part in the meeting of scientists and presented information on

International (Contd.):

recent surveys of the distribution and abundance of halibut in the Gulf of Alaska.

CENTRAL AMERICAN COMMON MARKET**COSTA RICA JOINS:**

Costa Rica formally joined the Central American Common Market on July 23, 1962. The member states of the region which have now signed the General Treaty of Central American Economic Integration are Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua.

At the end of July representatives of those countries meeting in San Jose, Costa Rica, signed further agreements establishing uniform tariffs on more than 95 percent of all products entering the area.

In June 1962 Costa Rica and Nicaragua formally ratified the 10-year Treaty of Preferential Exchange and Free Trade, signed in August 1961 by Costa Rica, Nicaragua, and Panama. This tripartite agreement is similar to the Economic Association Treaty ratified by El Salvador, Guatemala, and Honduras in April 1960, and likewise aims at speeding the process of economic integration. Both agreements are allowed within the framework of the General Treaty of Central American Economic Integration. (*Fortnightly Review*, August 11, 1962, of Bank of London & South America, Ltd.)

Note: See *Commercial Fisheries Review*, May 1961 p. 31.

FOOD AND AGRICULTURE ORGANIZATION**FISHERIES DISCUSSED AT SIXTH REGIONAL CONFERENCE FOR THE NEAR EAST:**

Two recommendations were sent to the Director-General of the Food and Agriculture Organization (FAO) with regard to fisheries by the Sixth FAO Regional Conference for the Near East held at Tel Ama-ra, Lebanon, July 30 to Au-gust 8, 1962. The recom-mendations were: (1) to assist in training person-nel, and (2) to advise mem-ber governments on the need for fish industry sur-veys. Member countries that have or are planning to increase the fishing industries in their countries include: Jordan, Kuwait, Lebanon, Saudi Arabia, Syrian Arab Republic,



United Arab Republic, Pakistan, Sudan, and Libya.

The Conference was attended by Delega-tions from the following countries: Afghani-stan, Iran, Jordan, Kuwait, Lebanon, Libya, Pakistan, Saudi Arabia, Sudan, Syrian Arab Republic, United Arab Republic, Yemen, France (representing French Somaliland), and the United Kingdom (representing Aden, Bahrein, Muscat and Oman, Qatar, and Tru-cial Oman). The following countries were represented by observers: Denmark, the Netherlands, and the United States. (United States Embassy, Beirut, report of August 16, 1962.)

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FISHING METHODS AND GEAR SEMINAR IN SOVIET UNION:

A seminar and study tour on fishing meth-ods and fishing-gear technology, for partici-pants from Asian and African countries, in the Union of Soviet Socialist Republics from August 18 to September 22, 1962, were spon-sored by the Food and Agriculture Organiza-tion (FAO).

The seminar and tour were organized by FAO's Fisheries Division at the invitation of and in cooperation with the U.S.S.R. Govern-ment under the technical assistance program of the United Nations. The two-week seminar was held in Moscow; the tour lasted three weeks and covered fisheries in Astrakhan, Baku, Yalta, and other places of fishing in-terest.

Some 25 to 30 participants were expected to attend, most of them officers charged with developing fishing industries in their home countries. Most of the countries invited were tropical or subtropical and emphasis was on warm-water fishing from small and medium mechanized craft of 25 to 100 feet in length.

The seminar and tour concentrated on fish-ing methods of main importance in Asian and African countries--long-lining and gill-net-ting, trawling in shallow water for fish and shrimp, tuna fishing and fishing with various types of traps, encircling nets, and purse seines. It also studied electronic devices for fish detection, and attracting fish by light.

Director of the seminar and tour was pro-vided by the U.S.S.R., with an associate di-rector from FAO.

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International (Contd.):

WORLD MEETING ON TUNA BIOLOGY URGES EXPANSION OF TUNA RESEARCH:

Fisheries biologists from around the world are urging stepped up efforts toward solving one of the sea's oldest riddles--the tuna--its behavior, migratory routes, spawning grounds, size of stocks, and the oceanic environment natural to each of the various species.

The international movement to supply answers to the many mysteries surrounding this most important of commercial fish comes as a result of the World Scientific Meeting on the Biology of Tunas and Related Species held in July 1962 in La Jolla, Calif.

At that 12-day meeting--first of its kind to be held on a global basis--248 scientists from 18 nations passed 20 resolutions, all of them designed to both expand and speed up all phases of world tuna investigation. One of the most important was for the Food and Agriculture Organization of the United Nations (FAO)--sponsor of the La Jolla meeting--to set up a Continuing Committee for the Facilitation of Tuna Research.

The proposed Continuing Committee would be made up of from 12 to 15 outstanding scientists from various countries, with a secretariat provided by FAO. The Committee will oversee the implementation of the Meeting's resolutions.

In a recent interview at FAO's Rome headquarters, the Director of the Organization's Fisheries Division said FAO has accepted the biologists' proposal and is now moving toward the establishment of the Committee. "We've needed such a committee for a long time," he said. "Most tunas live in international waters and practically all the maritime nations do at least some tuna fishing. These nations and their scientists are going to have to pull together if we are to make the fullest and wisest use of the sea's tuna resources."

Too Many Unknowns: Men have fished tuna since biblical times. Tunas are taken in all the world's oceans. There is no other major commercial fish that has such an international character. Since the end of the Second World War tuna fishing has developed into one of the world's greatest sea industries. During the past ten years alone the total catch has nearly doubled--from 500,000 metric tons in 1953 to just under a million

this year. Japan and the United States, in that order, dominate tuna fishing, but Peru, France, India, Spain, Portugal, Italy, Norway, and West Germany also support thriving tuna fishing fleets and Australia, South Africa, Brazil, and several other nations, particularly the West African ones, are striving to enlarge their own tuna fisheries.

Despite all this, scientists and fishermen agree, there are still altogether too many unknowns about the fish. Where, for instance, are the great tuna spawning grounds? Just how many species and subspecies of tuna are there and what is the difference between them? What is the most efficient way to fish each species? What are the tuna migration routes? What is the life span of these fish? And perhaps most important of all, how much tuna can be taken without depleting the oceans' natural stocks?

It is to answer this last question that there is particularly chronic need for more and better catch and total-fishing-effort statistics.

"Aside from the obvious value of tuna fishing to a country's economy," the Fisheries Division Director said. "We need to take as much tuna as possible to help feed the world's explosively growing population. Tuna is a protein-rich fish and it is precisely protein that is most lacking in the diet of our already too numerous undernourished."

"But to fish tuna really scientifically, we need to know a lot more answers than we have now."

Food Through Research: It was because of this need for more answers that FAO decided to call the La Jolla meeting. As one scientist put it: "A much greater understanding of the oceans of the world is needed not only in explaining the availability of tunas, but also in relation to all the natural resources of the sea."

The La Jolla group expressed much interest in the forthcoming 27-nation International Indian Ocean Expedition. Among their recommendations, the scientists urged that the expedition study the Indian Ocean's tuna wealth and take advantage of the opportunity to test the latest fishing gear and methods of collecting larvae and young tunas.

The inclusion of tuna study in this expedition could go far toward stimulating tuna fishing in the countries bordering on the Indian

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Ocean. All 27 of them are in need of greater supplies of protein rich foods.

On the systematics of tuna, the biologists recommended that a few major centers be selected for the housing of large scombrid fish collections. Three were cited as specially qualified: The United States National Museum of Washington, D. C., The Museum National d'Historie Naturelle of Paris, and the Fisheries Department of Kyoto University in Japan.

The biologists also called on all tuna fishing nations to launch wider tagging programs, using improved tags and better coordinated systems of recovery. Tagging has proved to be one of the best methods for identifying tuna stocks, growth, and migrations.

As Japan and the United States are the world leaders in tuna fishing, the Conference urged the two nations to carry out a joint cooperative study of the albacore and bluefin tunas of the Northern Pacific. Bluefin, the largest of the six major species, and albacore, a light meat tuna, make up the bulk of the Japanese and American tuna catches.

The other principal species are the big-eyed, yellowfin, skipjack, and the bonitos. In size, the tunas range from bonitos of less than 18 inches in length and 10 pounds in weight to the regal bluefins that sometimes reach 15 feet and more than 1,500 pounds.

West Africa is another potentially rich tuna fishing area that drew the La Jolla biologists' attention. They suggested that FAO aid West African countries in setting up a regional commission similar to the Inter-American Tropical Tuna Commission. The latter's work has greatly contributed to the development of tuna fishing in American waters.

A last important recommendation of the La Jolla group requested FAO's Director General to call a world meeting of experts on the economic aspects of tuna fisheries. FAO, the Fisheries Division Director reports, agrees such a meeting should be held.

"If all goes well," he said. "We'll try to hold it in late 1964 or early 1965."

Probable Future Trends: In the course of the La Jolla meeting, with so many of the

world's finest tuna biologists on hand, predictions as to future trends inevitably came up.

Some of these were:

1. By 1970 the world tuna demand will probably reach 1.5 million tons, 50 percent again over present world landings. This means there is still plenty of room--room for all--for expanding the various tuna fisheries.

2. The greatest immediate increase in tuna catches will probably come not so much from further build up of the long-range fleets, but from increased development of coastal fisheries based on small, economical, locally-based vessels. These may well fish primarily for the smaller tuna-like fishes. Such a development should enrich local nutrition and, in time, put more tuna on the export market.

3. If the constantly rising demand for tuna is to be intelligently met with maximum benefit for all, consumer and fisherman, large and small fishing nations, research must march hand in hand with greater fishing effort.

The La Jolla scientists and their FAO colleagues believe that, now, perhaps it will.

The eight sections of the meeting covered species identification and distribution (adults, larvae, and eggs); population identification; size and composition of stocks; availability (accessibility and vulnerability); physiology and behavior; fishing methods; statistics of catch and effort; future lines of tuna research. There were also four working groups which considered blood samples; stock transfers; identification of larvae and juveniles; and tagging.

Presented at the meeting were 10 papers on methodology. Included were a review of the fishes of the family Scombridae, as well as distribution of eggs, larvae, and adults; subpopulation identification; size and composition of tuna stocks; matter of availability and harvest of tunas; behavior and physiology; fishing techniques for tunas and skipjack; need for statistics of catch and effort; future lines of research; and worldwide tuna research planning.

The 29 papers on species synopses included biological data on bonito (*Sarda sarda*), black skipjack (*Euthynnus lineatus*); bonito (*Sarda orientalis*); frigate mackerel (*Auxis thazard*); little tuna (*Euthynnus affinis*); Kuro-maguro *Thunnus orientalis*; little tuna (*Eu-*

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thynnus yaito); albacore (Thunnus germo); yellowfin tuna (Neothunnus macropterus); big-eyed tuna (Parathunnus mebachi); bluefin tuna (Thunnus thynnus); California bluefin tuna (Thunnus saliens); big-eyed tuna (Parathunnus sibilis); skipjack (Katsuwonus pelamis); yellowfin tuna (Thunnus or Neothunnus albacares); bluefin tuna (Thunnus thynnus maccoyii and Thunnus thynnus orientalis); little tuna (Euthynnus alleteratus); albacore (Thunnus alalunga); blackfin tuna (Thunnus atlanticus); yellowfin tuna (Thunnus albacares).

In addition there were 40 experience papers and 9 information papers. The last of the information papers consisted of the resolutions of the Pacific Tuna Biology Conference, Honolulu, Hawaii, August 1961.

This meeting on the biology of the tunas was concerned both with the assessment of present knowledge and with the questions that may be asked of tuna biologists in the future.

The most obvious and dramatic aspects of the world tuna situation developed at the meeting were two: (1) Up for consideration was not an unutilized resource, nor a resource at the terminal stages of development, but rather one in mid-stream. Demand and yield have doubled approximately each ten years. Current landings are approximately 800,000 tons annually and there is every indication that market demand for 1,500,000 tons will exist by 1970. At this date, at least one population, the eastern Pacific yellowfin, has apparently reached the limits of its productivity. Indications are that other populations are responding to fishing in a predictable manner. This exponentially expanding demand on what must be a finite resource, will soon be the central biological problem before world tuna scientists, though at the moment the world-wide central problem appears to be the development of a more complete understanding of their ecology and behavior leading toward more efficient utilization of this valuable resource. (2) The resource is international in character. Excepting for whales, no other major, currently utilized fishery resource shares this character in such a spectacular way. Most of the tunas live in international waters, and modern fishing techniques and the modern means of distributing the product places no group of people in a favored position, excepting for very special situations. Tuna

scientists around the world, then, must share global responsibilities for providing the scientific basis for the full and wise use of the tuna and tuna-like fishes.

The meeting principally indicated areas of research that seem to require acceleration, and/or changes in direction to the extent that the meeting has provided guidelines.

Note: See Commercial Fisheries Review, August 1962 p. 49.

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SIXTH REGIONAL CONFERENCE FOR ASIA AND THE FAR EAST:

The Food and Agriculture Organization (FAO) Sixth Regional Conference for Asia and the Far East was held at Kuala Lumpur, Federation of Malaya, September 15-29, 1962, to review the results in Asia and the Far East of technical and economic work in the fields of agriculture, fisheries, forestry, and nutrition over the two preceding years, and to consider at policy level the recommendations of the various technical meetings. This is one of the four regional conferences that are held at two-year intervals between sessions of the FAO Conference.

NORDIC COUNTRIES**CLOSER FISHERIES COOPERATION:**

The Fisheries Ministers of Denmark, Finland, Iceland, Norway, and Sweden, at a meeting in Trondheim, Norway, in August 1962 agreed on the establishment of a Nordic liaison committee to coordinate fisheries policies of the five countries. The joint committee will comprise four representatives from each country. Two are to be named by the Government and two by national trade associations. The chairmanship will rotate among the countries.

In the opinion of the Fisheries Ministers, the Nordic liaison committee might consider advantageously such questions as taxation of the fish stock, fisheries research, price formations, commercial policy, standardization of packaging, and setting up a joint Nordic rescue service. Concrete proposals for a joint rescue service in the North Sea, now being drafted by a Danish-Norwegian-Swedish committee, were also discussed.

Norwegian fisheries researcher Finn Devold, in a report on Nordic herring fisheries over the past 50 years, told the Ministers that the herring quantity estimated in Norwegian waters in 1962 was only one-fourth as

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large as it was six years ago. He saw some hope, however, that the influx of young fish might stem the steady decline in the stock of winter herring along the Norwegian coast. (News of Norway, August 23, 1962.)

UNESCO INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION

ARABIAN SEA PHASE OF INDIAN OCEAN OCEANOGRAPHIC EXPEDITION DEFINED:

At the working meeting for coordination of the scientific program of the International Indian Ocean Expedition (IOE), it was decided to enlarge the area covered by the discussion to include all the Arabian Sea sector north of latitude 10° S. Other conclusions reached by the working meeting held in Wormley, England, July 9-11, 1962, were:

(1) That a proposed aircraft study by the U. S. Weather Bureau of air-sea interaction during May-July 1963 will require continuous observations from 30 or more research vessels arranged in a geometric spacing of 100-200 miles.

(2) The 1960 Copenhagen recommendations concerning physical oceanography should be strengthened by decreasing station spacing to not in excess of 60 miles, and continuing all possible stations to the bottom.

(3) Special attention should be paid to: (a) the stagnant layers discovered by the Vityaz in the Arabian Sea; (b) hydrogen sulfide determinations made in the 625-1,000 meter layers; and (c) means taken to eliminate interference by hydrogen sulfide in the oxygen determination.

(4) A list of standard stations was established and two were recommended for the Bay of Bengal. Other standardization was recommended including the Worthington air equilibration technique as a standard for the Winkler titration.

(5) The unused cable between Madagascar and Africa should be investigated as a means of monitoring current flow by geokinetic electromagnetic means.

(6) A list of locations of desirable tide gauges was established.

(7) Additions were made to the list of biological collections and observations.

(8) The production of a bottom contour chart of the Indian Ocean by cooperative effort was encouraged.

Meetings were also scheduled for two other sections of the Indian Ocean. Those were for August 6-8 in Sidney, Australia, for the southeast quadrant, and later in the year for the Bay of Bengal sector, possibly in Bangkok, Thailand. (National Oceanographic Data Center Newsletter, Aug. 15, 1962.)

Note: See Commercial Fisheries Review, Sept. 1962 p. 58.

FISH MEAL**WORLD PRODUCTION, JUNE 1962:**

According to preliminary data from the International Association of Fish Meal Manufacturers, world production of fish meal in June 1962 amounted to about 211,478 metric tons, an increase of 7.1 percent over world production in June 1961.

Most of the principal countries producing fish meal submit data to the Association monthly (see table).

Country	World Fish-Meal Production by Countries, June 1962		
	June		Jan.-June 1962
	1962	1961	
.... (Metric Tons)			
Canada	7,471	7,211	43,279
Denmark	10,641	9,315	38,870
France	1,100	1,100	6,600
German Federal Republic	3,837	5,564	36,121
Netherlands	200	700	2,400
Spain	2,236	2,427	13,712
Sweden	167	226	2,496
United Kingdom	6,787	6,399	37,648
United States	52,978	49,351	103,750
Angola	2,483	4,723	14,467
Iceland	5,400	3,715	32,330
Norway	10,739	14,876	30,684
Peru	83,819	68,718	544,442
South Africa (including South West Africa)	23,600	23,100	158,196
Total	211,478	197,425	1,064,995

Note: Belgium, Chile, Japan, and Morocco do not report their fish-meal production to the International Association of Fish Meal Manufacturers at present.

The increase in world fish-meal production in June 1962 was mainly due to more output in Peru (up 22.0 percent), the United States (up 7.3 percent), Iceland (up 45.3 percent), and Denmark (up 14.2 percent). This year through June, Peru had increased landings of anchoveta; the United States had heavier landings of menhaden; Iceland's landings of herring were higher; and Denmark's landings of industrial fish were up. The increase was partly offset by a drop in fish-meal production in Norway (down 27.8 percent), Angola (down 47.4 percent), and Germany (down 30.7 percent). The herring fishery was a failure in Norway this year and Angola was plagued with organizational and marketing problems as well as declining catches.

Peru accounted for 39.6 percent of world fish-meal production (for countries listed) in June 1962, followed by the United States with 25.1 percent, and South Africa with 11.1 percent.

During the first six months of 1962, world fish-meal production for countries listed was 1,064,995 metric tons. Peru accounted for 51.1 percent of total production during that period, followed by South Africa with 14.9 percent, and the United States with 9.7 percent.

International (Contd.):

MARINE OILS

ESTIMATED WORLD PRODUCTION AND FOREIGN TRADE, 1958-62:

World production of marine oils (including whale and sperm whale oils, and fish and fish-liver oils) in 1962 is expected to increase, but at a lower rate than in the preceding three years. Increased production of fish oils will be partly offset by a decline in whale oil from the Antarctic. Sperm whale oil production from areas outside the Antarctic is expected to show a small increase.

Table 1 - Estimated World Production of Marine Oils, 1958-62

Type	1/1962	2/1961	2/1960	2/1959	1958
..... (1,000 Short Tons)					
Whale	402	428	418	417	435
Sperm whale	126	124	122	130	135
Fish (including liver)	790	750	590	575	515
Total	1,318	1,302	1,130	1,122	1,085

¹/Forecast.²/Revised.

World exports of marine oils are expected to increase to another all-time high in 1962, but the increase will not be as large as in the preceding two years. Exports of fish oil and sperm whale oil will increase, but exports of whale oil will decline.

Marine Oils	1/1962	2/1961	2/1960	2/1959	2/1958
.....(1,000 Short Tons),					
Whale	402	428	418	417	435
Sperm whale	126	124	122	130	135
Fish (including liver)	335	300	248	179	130
Total	863	852	788	726	700

¹/Forecast.²/Revised.

Note: Only exports from producing countries are included.

Production and exports of fish oil in 1962 are expected to increase because of greater output in Peru, Chile, and Iceland which produce mainly for export markets. A sharp drop in fish oil production in Norway will partly offset the increase in world production of fish oil, but will stimulate fish oil exports to Norway. Very little, if any, production increase is expected in the Republic of South Africa or the United States.

Edible vegetable oils compete with edible marine oils on the world market. Exports of edible vegetable oils are expected to be at an all-time high in 1962, exceeding last year's total by 25 percent. (Foreign Crops and Markets, U. S. Department of Agriculture, August 30, 1962.)

Note: See Commercial Fisheries Review, Nov. 1961 p. 41.

TRANSPORTATION

SELECTED OCEAN FREIGHT RATES FOR SELECTED FISHERY PRODUCTS AND BYPRODUCTS:

Product	Ocean Freight Rates	
	US\$/Metric Tons	US\$/Short Ton
<u>From Callao (Peru) to Rotterdam (Holland) or Le Havre (France) or Hamburg (Germany):</u>		
Fish meal: Up to Aug. 31, 1962	22.00	19.96
After Aug. 31, 1962	1/	1/
Fish oil: In bulk	16.00	14.51
In drums	22.40	20.32
Canned tuna: In cartons	30.80	27.94
In cases	2/26.60	2/24.13
	<u>Shillings/ Metric Ton</u>	<u>US\$/Short Ton</u>
<u>From Callao (Peru) to Liverpool (England):</u>		
Fish meal: Up to Aug. 31, 1962	157	19.94
After Aug. 31, 1962	1/	1/
Fish oil: In bulk	114	14.48
In drums	160	20.32
Canned tuna: In cartons	220	27.94
In cases	190	24.13
	<u>Shillings/Long Ton</u>	<u>US\$/Short Ton</u>
<u>From Yokohama (Japan) to Rotterdam (Holland) or Hamburg (Germany):</u>		
Fish oil: Contract rate	152 (plus 1 percent ad valorem)	19.00 (plus 1 percent ad valorem)
Non-contract rate	167.5 (plus 1.1 percent ad valorem)	20.94 (plus 1.1 percent ad valorem)
Canned salmon and canned tuna:		
Contract rate	3/208.5	3/26.06
Non-contract rate	230	28.75
	<u>Shillings/Long Ton</u>	<u>US\$/Short Ton</u>
<u>From Capetown (South Africa) to Rotterdam (Holland) or Hamburg (Germany) or Liverpool (England)²:</u>		
Fish oil in bulk ³ :		
With a value up to \$50 (\$140) per long ton	113	14.12
With a value between \$50-57 (\$140-160) per long ton	135	16.87
With a value over \$70 (\$196) per long ton	150	18.75
Fish meal: In bags	149	18.62
	<u>Shillings/40 Cubic Feet</u>	<u>US\$/40 Cubic Feet</u>
Canned sardines (pilchards)	134	18.76

¹/Not available.²/At ship's option, the rate may be \$26.60 per 40 cubic feet of space.³/At ship's option, the rate may be 208.5 shillings (\$29.19) per 40 cubic feet of space.⁴/Rates from Walvis Bay, South-West Africa, not available.⁵/Rates established up to Dec. 21, 1962.

Source: United States Embassy, Copenhagen, August 29, 1962.

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AFRICA

COMMON MARKET ESTABLISHED BY SIX NATIONS:

The establishment of an African Common Market was included among the seven economic agreements formulated at the Second Session of the Casablanca Powers¹ Economic Committee which met in Cairo, Egypt, March 26-April 2, 1962. The agreements, including the Treaty Establishing the African Common Market, were signed on April 2 by delegates of the six member nations: the Republics of Algeria, Ghana, Guinea, Mali, the United Arab Republic, and the Kingdom of Morocco.

The main purposes of the participating Governments in establishing the African Common Market are to achieve sustained economic growth, financial stability, and the full and rewarding employment of the human resources at its disposal. To bring about the most favorable conditions for promoting and regulating trade among them, and in conformity with the spirit and principles of the Casablanca Charter, the African Common Market is open to all independent African States on the following basis:

(1) More liberal trade for national commodities and products;

(2) Free movement of establishment rights, labor and employment for the development of economic activities;

(3) Freedom of transport, transit, and utilization of all means of communication, ports, and civil airports.

The Articles of five Sections comprising the Treaty establishing the African Common Market follow:

SECTION ONE: The Means: Article 1: In order to achieve the objectives of the Treaty, the Contracting Nations agreed:

(1) To establish a Customs Union among them, and to coordinate all customs tariffs, rules, and regulations that are applicable.

(2) To coordinate the import and export policies and all rules and regulations related to trade between them and to adopt a common policy regarding basic commodities.

(3) To unify customs regulations as regards specification and classification of products.

(4) To coordinate trade policies in fuel and power.

(5) To harmonize their social legislations.

(6) To establish organizations and agencies necessary for the implementation of the Treaty.

(7) To take all necessary measures for the realization of objectives planned.

SECTION TWO: The Provisions of the Treaty Customs Tariffs: Article 2: Each Contracting Party shall, within five years from the date of the coming into force of this Treaty, abolish all customs duties on its imports from the other member countries by a gradual reduction of the import levies on all products imported from member countries. This reduction shall be 25 percent during the first year. The percentage of reduction during the successive four years shall be determined by the Economic Committee of the Charter.

The reduction shall apply to the duties existing on March 31, 1962. After that date any member State which shall raise its duties shall not apply the increase to the rates applicable on the goods originating from other member States.

In order to safeguard their trade interests in certain manufactured products, two or more member States can conclude provisional bilateral agreements. A list of such manufactured products shall be decided on by mutual agreement.

Article 3. The reduction in customs duties, mentioned in Article 2, shall be made on all custom duties (fiscal and protective) levied on the imports of goods from member States of which goods are exempted if they are of local origin.

Article 4. A product shall be deemed of Common Market origin, benefiting from the reductions mentioned in Article 2, if it is either harvested or taken from the soil of the Common Market Countries, or manufactured in them. A manufactured product shall be considered a national product of a member country if it undergoes in the country concerned, a process of transformation amounting to at least 50 percent of its total cost of production.

Article 5. Each Contracting Party shall, by a progressive reduction, and within five years from the coming into force of the Treaty, abolish all restrictions on imports and exports of goods originating from the established African Common Market. This reduction shall be 25 percent during the first year.

Article 6. The Contracting Parties shall grant each other the most-favored-nation treatments as regards trade among them.

Article 7. The Contracting Parties shall give priority to the imports of goods from member countries.

Article 8. The Contracting Parties undertake to prohibit the re-export of both basic and manufactured goods to non-member countries unless otherwise agreed upon by the country of origin.

Article 9. Each Contracting Party shall facilitate the transit of goods from member countries through its territory, subject to the laws, rules, and regulations of its transit trade.

SECTION THREE: Administration: Article 10. The Contracting Parties shall establish a permanent body to be named "The Council of the African Common Market," hereinafter referred to as the "Council." The Council shall be entrusted with the implementation of the Treaty establishing the African Common Market. Its functions and powers shall be determined by the provisions of the present Treaty.

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Article 11. (1) The Council of the Common Market shall be composed of one permanent representative for each State assisted by advisers.

(2) The Permanent Seat of the Council of the Common Market shall be at Casablanca and the Council may hold its meetings in any other place of its choice.

(3) The term of office of the President of the Council shall be one year. The Contracting Parties shall appoint a President to the Council by rotation.

(4) The Council shall convene periodic meetings every six months. It may hold extraordinary meetings whenever necessary.

(5) The decisions of the Council shall be taken by unanimous vote, each member country having one vote unless the matter is referred to the Economic Committee of the Casablanca Charter.

Article 12. The Council shall carry out its functions with the assistance of permanent or temporary committees. The Council may, however, entrust experts from among the nationals of the Contracting Parties with carrying out studies or research on specific questions.

Article 13. (1) The Council shall enjoy financial and administrative autonomy and shall have its own budget supplied by the member States. The Council shall submit annually, a draft budget to the Permanent Secretariat of the Charter which shall be entrusted with providing the necessary funds.

(2) The Council shall, at its first meeting, lay down its own rules of procedure.

Article 14. The Governments of the Contracting Parties shall appoint their representatives at the Council within a maximum period of one month from the date of the coming into force of this Treaty. The Council shall carry out its functions upon its formation.

Article 15. The Council shall carry out the functions and exercise the powers provided for in this Treaty and its annexes, as well as other prerogatives which may be deemed necessary for the successful implementation of the provisions of this Treaty, with special regard to the following:

(1) The implementation of the provisions of this Treaty and annexes, as well as all decisions taken in application of the present Treaty and annexes.

(2) The supervision of the work of its committees and subsidiary organs.

(3) The recruitment of personnel and experts responsible to the council itself, in conformity with the provisions of the present Treaty.

(4) Coordination of the Foreign Trade Policies of the Member States.

Article 16. The Council shall submit a report on its activities to the Economic Committee of the States of Casablanca Charter at each meeting of its members.

SECTION FOUR: Transitory Provisions: Article 17. When assuming its responsibilities, the Council shall take into consideration the special circumstances prevailing in some member countries.

Article 18. Two or more Contracting Parties may conclude closer economic agreements than those prescribed in this Treaty.

Article 19. Any member country desiring to conclude an agreement with any economic bloc or customs union outside the Casablanca Charter should first consult with the other Contracting Parties. Under no circumstances must an individual agreement prejudice the interests of the African Common Market.

SECTION FIVE: Ratification and Admission: Article 20. This treaty shall be ratified on June 1, 1962 at the latest, by the Contracting Parties in accordance with their respective constitutional procedures. The instruments of ratification shall be deposited at the Permanent Secretariat of the Charter. Each deposit shall be recorded and other contracting parties shall be notified.

Article 21. Any African State joining the Casablanca Charter in the future shall, at its request, be admitted as a Contracting Party to this Treaty.

Any African non-member State may adhere to this Treaty or associate itself with it according to the procedure to be determined by the Council of the African Common Market.

Any application by a non-member State for integration or association shall be examined by the Economic Committee of the Charter, and submitted to the Political Commission for approval.

Article 22. This treaty shall come into force one month after the deposit of the instruments of ratification by two of the Signatory States. This Treaty shall be applicable to other States one month after the deposit of their instruments of ratification or of admission.

The Treaty establishing the African Common Market was drawn up in Cairo, Egypt, on April 1, 1962, in 3 original copies in the Arabic, English, and French languages. The 3 original copies were to be deposited at the Permanent Secretariat of the Casablanca Charter, and a certified true copy delivered to each Contracting Party, and to any State subsequently agreeing to the Treaty. Included among the other economic agreements was: (1) agreement for establishment of the African Development Bank; (2) agreement on the establishment of a Council for African Economic Unity; Convention of Economic and Technical Cooperation. (United States Embassy, Cairo, May 15, 1962.)

INTERNATIONAL COUNCIL FOR THE EXPLORATION OF THE SEA

FIFTIETH STATUTORY MEETING HELD IN COPENHAGEN:

The fiftieth Statutory Meeting of the International Council for the Exploration of the Sea was held in Copenhagen, Denmark, September 28-October 10, 1962. The agenda for the opening meeting of the General Assembly included:

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1. Report on Permanent Commission.
2. Report on International Commission for the Northwest Atlantic Fisheries.
3. Report on Intergovernmental Oceanographic Commission.
4. Report on European Inland Fisheries Advisory Commission.
5. Report on the Meeting on the Biology of Tuna and Related Species.
6. Report on International Whaling Commission.

A special meeting was devoted to problems in exploiting and regulating fisheries for shellfish. The program of the Council included meetings by the committees on plankton, gadoid fish, scombriform fish, herring, salmon and trout, sardines, and shellfish. There were also meetings by the committees on hydrography, statistics, and comparative fishing; and the committees on the Atlantic, Baltic-Belt Seas, distant Northern Seas, and near Northern Seas.

**Australia****EXPORTER RECOMMENDS NEW METHOD OF SELLING LOBSTER TAILS TO UNITED STATES:**

An orderly system for exporting Australian frozen spiny lobster tails to the United States is needed. This is the opinion of an Australian exporter who, in the spring of 1962, made an on-the-spot survey of the United States market. The exporter is the director of the largest privately-owned spiny lobster tail exporting firm in Australia.

The Australian exporter said, "A feeling of uncertainty prevails among the United States importers of Australian crays (lobster tails) especially on the East Coast. It is quite possible that large stocks which have had to be accumulated on account of irregular sailings to that coast will have to be sold at a loss because direct sales have been made from Australia to other than primary importers." He felt that sales to other than primary importers in the United States had caused a loss of good will, particularly on

the East Coast which also obtained supplies from South Africa and South America. He suggested that a system similar to South Africa's, where a limited number of exporters sell to a limited number of importers, was ideal.

Australia is the third largest exporter of lobster tails to the United States. They shipped over 8,026,000 pounds of frozen lobster tails to the United States in 1961. (Fish Trades Review, Australia, June 1962.)

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SHRIMP FISHERY STARTED IN WESTERN AUSTRALIA:

A bright future is predicted for Western Australia's shrimp, started on a commercial basis for the first time early this summer by a Whaling Company at Carnarvon. Some shrimp fishing had been attempted before, but there were no processing plants, freezers, or transports to handle the catch properly.

Some experts believe the Western Australia shrimp fishery potential is equal to Queensland where the industry employs 300 boats and is worth £2 million (US\$4.5 million) a year in exports.

Until the extent of the shrimp grounds is full known, it would be impossible to say how much the shrimp fishery could be worth to Western Australia. All that can be said at present is that results have been encouraging. The Fremantle spiny lobster fleet, which is laid up every winter, is particularly interested.

The shrimp season in the northwest coincides with the slack period down south. If this season's shrimp trawling is successful, many of the Fremantle boats will be working next year instead of lying idle over the winter.

The whaling company has chartered one of Queensland's top shrimp fishing skipper and his trawler Dorothea W., for their pioneering effort.

The company has also engaged two Queensland crews to man their specially-designed shrimp trawlers Nor I and Nor II. The boats were built at Fremantle, to Queensland design, at a cost of £14,000 (\$31,500) each.

The shrimp have received an enthusiastic reception in the Sydney fish trade because of

Australia (Contd.):

their uniformity in size and quality. (Australian Fish Trades Review, July 1962.)

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NEW TYPE UNDERWATER VEHICLE FOR FISHERY RESEARCH:

A new type of underwater vehicle has been developed and built in South Australia. It could have many uses in commercial fishing and fish research. The vessel is called a "Towvane" and its designer is M. E. Lawrie, a commercial diver and slipway owner of Port Adelaide.



New type of underwater vehicle--"Towvane"--being hauled aboard a vessel.

It can be towed behind any vessel over 35 feet long and needs no motive power of its own. Instructions are given to the operator by telephone from the towing vessel. This means that the "Towvane" rider need have no experience in underwater activity.

The new vehicle could be used to observe fish habits and effectiveness of fishing and trawling methods, survey the sea floor, search for and inspect underwater installations. Floodlights can be carried for use in murky waters.

Among the vehicle's advantages over "conventional" self-propelled submarines are its readiness for use at any time and the little maintenance or preparation needed.

It can be carried on deck and requires no special cradles or accommodation. A winch is used to launch or recover the "Towvane."

No special clothing is needed and once the vessel has been "trimmed" underwater the rider is free to observe and record his observations. In an underwater survey made recently, an engineer made on-the-spot notes on a tape-recorder carried on his lap.

There are no engines to operate, refuel, or maintain. And no turbulence from screws.

The "Towvane" has a range and speed limited only by that of the vessel towing it. Therefore it can be taken out to fishing grounds that would be inaccessible to other types of vessel.

The ability to send the expert comfortably below to make his own unworried observations is an advantage over secondhand reports from frogmen or other divers. Should the towing cable break the vessel will rise to the surface. The vehicle is of welded construction, built to vessel pressure standards.

It is of simple design and would lend itself to mass-production methods. It has been proved in many tests and open-sea trips. "Towvanes" could work in groups to sweep wide areas, being linked together by telephone.

The model being developed at present is 3 feet in diameter and stands about 6 feet high.

The specifications are: Depth limited only by hull thickness (probably suited to depths less than 1,000 feet; weight 1,600 pounds; positive buoyancy 30 pounds; plywood control vanes hydrostatically balanced; air supply; pressure release valve; transparent plastic window with 360 degree vision; interior and exterior accommodation for all types of ancillary equipment; telephone; interior hatch release.

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WHALE OIL PRODUCTION DOWN IN 1962:

Australian baleen whale oil production during the 1962 season is expected to drop to 7,000 short tons, down 44 percent from production of 12,500 tons in 1961. Sperm whale oil production is expected to slightly exceed last year's output of 3,500 tons.

A sharp drop in the number of whales migrating from Antarctic waters for mating in warmer northern waters has caused a drastic decline in the abundance of humpback whales off the East Coast of Australia. Some observ-

Australia (Contd.):

ors blame the shortage on the lack of an effective international convention for limiting kills in other regions. The shore-based Tangalooma station at Moreton Island on the East Coast announced in early August that it had caught only 68 whales since the start of the whaling season June 18, 1962, and was suspending operations. The station on Norfolk Island on the East Coast also suspended operations, leaving only one station operating on the East Coast. The firm operating the station had been allocated a quota of 600 whales in the three months' season which opened last June 18. In the first three weeks of the season only 29 whales were caught. Last year the firm had a quota of 660 whales, but caught only 593. In recent years the annual value of production from Tangalooma has been about £A100,000 (US\$225,000). In 1959/60 (the last year for which figures are available) it was worth £A96,384 (\$217,000). Unofficial sources quote last year's production value at slightly over £75,000 (\$169,000). This year's operating costs will far exceed the revenue.

The West Coast catch by shore-based whaling stations at Carnavan and Frenchman Bay also declined. But the decline was not as disastrous as on the East Coast, in part because of the availability of sperm whales. West Coast stations continued to operate.

The Australian Whaling industry has had a long history dating back to 1788. Commercially it has had many vicissitudes frequently due to overhunting. For just short of ten years the humpback whale which uses the coastal waters of eastern Australia for its annual migration from Antarctica to the tropics for breeding purposes has been hunted by chasers from the shore base at Tangalooma, on Moreton Island, Queensland. There was no difficulty in filling quotas of up to 660 whales in a season. But over the last few years there have been fewer whales to catch. This is not surprising when it is considered that a female humpback rarely produces more than one calf every two years, and that the species is hunted in other regions. (United States Consulate, Brisbane, August 10, 1962.)

Note: See Commercial Fisheries Review, Sept. 1962 p. 59, July 1961 p. 45.



Canada

NEW INSTITUTE OF OCEANOGRAPHY:

The construction of a new Canadian Institute of Oceanography at Bedford, Nova Scotia, was nearing completion about the middle of this year. The Institute, which is a part of the Marine Sciences Branch of the Canadian Department of Mines and Technical Surveys, will cost US\$4.5 million when completed. A similar center is planned for Canada's west coast in about three years. The Bedford Institute, near Dartmouth, Nova Scotia, will have an office and laboratory building, docking facilities for ten ships, woodworking and electrical shops.

In addition to the newly-built oceanographic Institute, the Canadians have a long-range oceanographic shipbuilding program under way for survey and research work. As of May 1962, three ships were being designed or under construction. One of the ships, the Maxwell, was launched last year. The largest, the Hudson, will have a cruising range of 15,000 miles. The two additional vessels will be about 225 feet long and will replace obsolete ones now in use. (National Oceanographic Data Center Newsletter, May 31, 1962.)



Ceylon

FISHERIES DEVELOPMENT:

Landings and Imports, 1957-1960: Ceylon's total fishery landings in 1960 was 28.7 percent greater than in 1957. Imports and per capita consumption of fishery products also increased from 1957 through 1960. Three times as much fishery products are being im-

Item	Table 1 - Ceylon's Landings, Imports, and Per Capita Consumption of Fishery Products, 1957-60			
	1960	1959	1958	1957
Landings	49,001	43,832	40,032	38,065
Imports	134,479	122,783	130,796	106,523
Total Supply	183,480	166,615	170,828	144,588
Percentage of Landings to Total Supply	26.7	26.3	23.4	26.3
Annual Per Capita Consumption of Fishery Products in Ceylon	41.79	38.80	40.77	35.30

Source: Ceylon Department of Fisheries.

ported as are produced locally. Data in Table 2 show that most of the imports con-

Ceylon (Contd.):

sist of dried or cured fish. A significant amount of canned and frozen fish also is imported.

Table 2 - Ceylon's Imports of Selected Fishery Products, 1960

Product	Quantity	Value	
		Long Tons	C. Rs. 1,000
Maldive fish . . .	3,095	11,245	2,364
Dried sprats . . .	5,278	18,771	3,947
Other dried fish . .	593	1,238	260
Salt-dry fish . . .	30,848	59,308	12,470
Salt-wet fish (Jadi)	7,399	2,764	581
Dried shrimp . . .	1,229	2,985	628
Canned fish . . .	6,136	8,876	1,866
Frozen fish . . .	61	139	29

Note: Values converted at 4,756 Ceylon rupees equal US\$1.

Source: Ceylon Department of Fisheries.

Mechanization of Fishing Fleet: The increase in Ceylon's landings has been achieved by mechanizing part of the fishing fleet. In 1951, when the Government of Ceylon first decided to start mechanizing fishing boats, not one of Ceylon's 20,000 fishing craft had a motor. In 1952, total fishery landing amounted to only about 25,000 metric tons. In



Fig. 1 - A kattamaran near Jaffna on the north coast of Ceylon on the way to fishing grounds. This type of boat is made of five logs pegged and tied together, and equipped with centerboard.

1959, the Food and Agriculture Organization (FAO) sent a Finnish naval architect to Ceylon following a request by the Government of Ceylon for an expert capable of designing an ideal fishing boat for Ceylonese waters. (Editor's Note: In the early years of the mechanization program, the motorized fishing vessels built in Ceylon were based on designs first developed by FAO naval architects in India for Indian fishing vessels.) The Finnish expert designed a 28-foot inboard motor vessel that is now known throughout Ceylon as the "E-26." In the summer of 1962, there were about 600 of those boats in operation, many of them in the rich shallow waters of the 55-mile Palk Strait between Ceylon and India.



Fig. 2 - A Food and Agriculture Organization (FAO) expert installed two motors on two Ceylonese craft to demonstrate how the local boats could be motorized to advantage.

The "E-26" carries a crew of five and its average daily catch during the main fishing season between December and April is above a thousand pounds. This is far above the catch of any other Ceylonese vessel. The Finnish expert is now working on an improved version of the "E-26" which will be four feet longer and specially designed for fishing in the rougher northern waters.

Ceylon still has about 400 of the older model inboard motor boats which were built earlier in the mechanization program. They carry only 12 nets while the "E-26" can carry 50.

The Finnish naval architect also helped the Government start a program to mechanize Ceylon's traditional fishing craft by adding outboard motors. Ceylon's traditional fishing fleet consists of kattamarans (log rafts with a sail and a 2-man crew), teppams (a smaller version of the kattamaran), orus (outrigger sailing canoes), and vallams (dugouts with or without outriggers). All traditional craft can be beach-landed.

Ceylon (Contd.):

About 400 teppams and 200 kattamarans have been mechanized. The teppams require outboard motors of from 4-10 horsepower while the larger kattamarans need more powerful motors. A total of 200 vallams and orus have also been mechanized.



Fig. 3 - Speed trials of a small outrigger canoe fitted with a 10-hp, outboard motor on the south coast of Ceylon. FAO expert aided in introducing outboard motors for use on this type of boat.

The Finnish expert commented, "We figured putting outboards on these boats would increase their catch about five times. Actually it has been closer to ten." A non-mechanized kattamaran takes 10-12 pounds of fish per day. A 15-pound catch is considered good. For a mechanized kattamaran a catch of 120 pounds per day is normal. Improved tackle and nets have also helped increase the catch.

The mechanization program has been financed for the most part by Government loans.

Revised Plan for Fisheries Development: Investment in the fishing industry has fallen short of the goals announced in Ceylon's Ten Year Plan for the development of the fishing industry, which was published by the Government in 1959. The Plan had 1958/59 as its base period. In the summer of 1962, the Government of Ceylon published a "Memorandum on Development Projects of the Department of Fisheries for Which Foreign Aid and Assistance Is Sought." The "Memorandum" reviews the projects under the Ten Year Plan and makes recommendations for their revision. It states that the goal of self-sufficiency in fish production has been given less emphasis because of underinvestment in the fishing industry and increased per capita consumption. A shortage of harbors is cited as the main bottleneck hampering other projects under the Ten Year Plan.

According to the original Plan, 1,650 mechanized vessels were to be constructed during the period 1958/60-1959/61 and 650

more in the year 1961/62, bringing the total to 2,300. Actually, just under 700 vessels had been constructed by the end of 1958/61. If the present target of 500 to be built in 1961/62 is reached, the total will be little more than half that of the Ten Year Plan target. The "Memorandum" says that the goal was not met because of initial inexperience in this type of boat building; poor recoveries of loan installments; and slow construction of fishery harbors. The revised plan of the Department of Fisheries is to launch 500 vessels annually for the next three years. When more harbors are available, it is hoped to step up the rate of construction.

The problem of additional harbors is a vital one as it is estimated that present harbors will accommodate only 2,000 vessels. A survey carried out in 1960 by the International Engineering Consultants Association of Japan recommended the construction of 17 harbors at an estimated cost of about Rs. 140 million (\$29.4 million). The estimate will probably need revision. The "Memorandum" states that the Government of Japan has officially indicated that it would assist in harbor construction. Even if decisions are made promptly, and plans are carried out, harbor construction time is estimated at from 2 to 3 years.

Because of limited harbor space for some time to come, the Department of Fisheries pointed out the necessity of continuing to mechanize the traditional craft which can easily be beached and now produce about 60 percent of the annual catch. The original program in the Ten Year Plan called for the mechanization of 1,700 traditional craft at a cost of Rs. 5.8 million (\$1.2 million). A total of 5,170 craft were to be provided with modern fishing gear at a cost of Rs. 7.8 million (\$1.6 million). The Department of Fisheries now proposes to recommend a modified plan under which marine engines and fishing gear will be given at subsidized rates to fishermen owning approved registered craft.

The new plan proposes to mechanize 500 out of 2,627 vallams, and at least 500 out of about 7,263 orus. Out of about 4,400 teppams and 2,200 larger kattamarans, it is proposed to mechanize at least 500 to 600.

Engine breakdowns on mechanized vessels have been substantial, due to the inexperience of fishermen. The "Memorandum" reports that engine suppliers will arrange training classes for mechanics and the Fisheries Training Center planned with Japanese aid

Ceylon (Contd.):

will give the necessary training to both fishermen and mechanics. A Food and Agriculture Organization (FAO) officer is reported to have started a detailed study of engines used by Ceylon's fishing vessels. A program on the use of improved gear and modern fishing techniques is being directed by another FAO expert with Japanese assistants and the staff of the Ceylon Department of Fisheries.

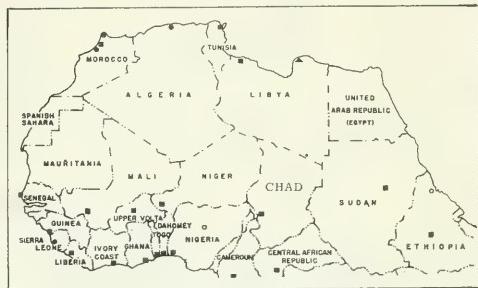
The Fisheries Department proposes to add a new trawler, for which Rs. 1.8 million (\$0.4 million) has been provided, to the two it now operates. The "Memorandum" points out that existing facilities at the cold-storage plant built with Canadian aid at Mutwal must be expanded if additional trawlers are to be accommodated. The Department of Fisheries has outlined a plan for expanding the Mutwal Project and hopes the plan can be carried out with foreign aid.

The Port Commission of Ceylon is building a harbor at Galle that will have 1,200 feet of alongside dock space for fishing vessels needing less than 20 feet of water. The harbor will cost Rs. 6.6 million (US\$1.4 million) and is scheduled for completion in 1964. The Government of Ceylon has invited foreign investors to join with Ceylon in developing Galle harbor as a base for a tuna long-line fishing venture. It is hoped that foreign investors will develop the necessary shore facilities at Galle for processing fish. Roads and transport facilities for marketing the catch landed at Galle are also needed. Foreign investors in a joint fishing venture at Galle would be asked to furnish vessels, train the Ceylonese in modern fishing methods, and eventually transfer all interest in the venture to the Ceylonese. Ceylon has published an outline of the joint venture proposed for Galle harbor. Ceylon is also interested in receiving plans for other joint fishing ventures with foreign countries. (United States Embassy, Colombo, August 24, 1962; Food and Agriculture Organization, Rome, August 6, 1962.)

Note: See *Commercial Fisheries Review*, Aug. 1962 p. 58, Mar. 1962 p. 36, Sept. 1961 p. 68, June 1961 p. 55, May 1961 p. 44, Mar. 1961 p. 48

**Chad****FISHING INDUSTRY OF CHAD:**

The annual fresh-water catch from rivers and lakes in landlocked Chad amounts to about 100,000 metric tons. About 30 percent of the catch is consumed fresh close to the fishing areas. The other 70 percent is smoke-dried



and yields about 18,000 tons of dried fish. Some dried fish is exported to neighboring countries. Lake Chad is not fished by the Chadians because the people along its shore consider fishing unworthy work. (United States Embassy, Fort Lamy, June 18, 1962). Note: See also under "Nigeria."

**Colombia****REGULATIONS ESTABLISHED ON
ISSUANCE OF SHRIMP FISHING PERMITS:**

Regulations covering issuance of shrimp fishing permits to foreign flag shrimp vessel operators, prescribed in Decree 1656, were issued by the Colombian Government on June 28, 1962. The text of the Colombian Decree follows:

Article 1. Foreign flag vessels larger than 10 tons associated with local firms, and which intend to fish for shrimp, shall be permitted to dock at a Colombian port only after having obtained the required fishing permits as issued by the Ministry of Agriculture.

Article 2. The issuance of fishing permits by the Ministry of Agriculture shall be subject to prior approval by the Colombian Merchant Marine headquarters (*Direccion de Marina Mercante Colombiana*). All documents relating to each vessel, such as registration and tonnage certificates and navigation permits, must be submitted to the Colombian Merchant Marine.

Article 3. Article 7 of Decree 1409 of 1958, which permitted only Colombian flag vessels to fish for shrimp, is hereby rescinded.

Article 4. This decree shall be effective from the date of its publication in the *Official Gazette*.

Earlier in 1962, the Colombian Government placed a restriction on the issuance of licenses to fish for shrimp. These were limited to 100 on the Pacific Coast and 60 on the Atlantic

Colombia (Contd.):

Coast. About 80 licensed operators were fishing shrimp on the Pacific Coast as of February 1962 and the prospects were then dim for additional licenses to be granted for that region due to an excessive supply of shrimp in local cold-storage centers. No operators were holding licenses for shrimp fishing on the Atlantic Coast at that time. (United States Embassy, Bogota, report of July 27, 1962.)

Note: See Commercial Fisheries Review, April 1962 p. 45.



Cuba

JAPAN EXPORTS FISH MEAL TO CUBA:

Japan, which hopes to export 20,000 metric tons of factoryship-produced fish meal this year, is reported to have contracted to deliver 2,000 metric tons of fish meal to



Cuba in exchange for Cuban sugar. Half of the contracted amount, or 1,000 tons, is said to have already been shipped. Export price of the fish meal sold to Cuba is approximately US\$147 a metric ton, f.o.b. Japan. (Suisan Keizai Shimbun, August 15, 1962.)



Dahomey

FAO FISHERY OFFICER ASSIGNED TO DAHOMEY:

The assignment of a Fishery Officer (a native of Belgium) to Dahomey (formerly a part of French West Africa) was announced by the Food and Agriculture Organization (FAO) on September 4, 1962. He will head a project being sponsored jointly by FAO and the United Nations' Expanded Program of Technical Assistance.

The newly-appointed Fishery Officer was scheduled to arrive in Dahomey about August 29. He will remain there for one

year, assisting the Government in reorganizing its fisheries. One of his principal tasks will be to draw up a plan for the improvement of both lagoon and sea fishing, including the resettlement of lagoon fishermen on the country's coast. The Fishery Officer assigned to Dahomey had made a preliminary survey of Dahomey's fisheries for FAO in April 1962.



Denmark

FISH FILLETS AND BLOCKS AND FISHERY INDUSTRIAL PRODUCTS EXPORTS, MAY 1962:

Denmark's exports of fresh and frozen fillets and blocks during the first five months of this year were 24.4 percent greater than in the same period of 1961, mainly because of an increase of 156.5 percent in exports of herring fillets.

Product	May		Jan.-May	
	1962	1961	1962	1961
Fillets and Blocks:				
Cod and related species	3,782	2,947	17,067	16,734
Flounder and sole	2,299	2,356	9,288	8,193
Herring	1,762	440	9,430	3,676
Other	118	88	379	477
Total	7,961	5,831	36,164	29,080
Industrial Products:				
Fish meal, fish solubles, and similar products	6,027	2,215	23,719	12,977

1/Shipments from the Faroe Islands and Greenland direct to foreign countries not included.



Hvide Sande, fishing port on west coast of Jutland, Denmark.

Denmark (Contd.):

Exports of cod and related species increased 2.0 percent and flounder and sole fillets were up 13.4 percent. During the first five months this year exports to the United States of fresh and frozen fillets and blocks of almost 7.3 million pounds (mostly cod and related species) were up 25.9 percent from the exports of about 5.8 million pounds in the same period of 1961.

Denmark's exports of fresh and frozen fish fillets and blocks during May 1962 were 36.5 percent greater than in the same month in 1961. Of the total exports, almost 2.3 million pounds (mostly cod and related species) were shipped to the United States in May.

Denmark's exports of fish meal, fish solubles, and similar products in January-May 1962 were 82.8 percent greater than in the same five months a year earlier.

During May 1962, Denmark exported almost 3 times the meal, fish solubles, and similar products shipped out in the same month of 1961. The principal buyers were West Germany, Finland, The Netherlands, and the United Kingdom.

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FISH FILLETS AND BLOCKS AND FISHERY INDUSTRIAL PRODUCTS EXPORTS, JUNE 1962:

Denmark's exports of fresh and frozen fillets and blocks during the first six months of this year were 16.7 percent greater than in the same period of 1961, mainly because of an increase of 148.4 percent in exports of herring fillets. Exports of flounder and sole fillets increased 11.9 percent, but exports of cod and related species declined 5.7 percent. During the first six months of this year exports to the United States of fresh and frozen fillets and blocks of about 8.4 million pounds (mostly cod and related species) were up 9.1 percent from the exports of about 7.7 million pounds in the same period of 1961.

Denmark's exports of fresh and frozen fish fillets and blocks during June 1962 were 17.6 percent below exports in the same month in 1961. Of the total exports, about 1.2 million pounds (mostly cod and related species) were shipped to the United States in June.

Denmark's Exports of Fresh and Frozen Fish Fillets and Blocks and Fishery Industrial Products, June 1962/1				
Product	June		Jan.-June	
	1962	1961	1962	1961
<i>Fillet and Blocks:</i>				
Cod and related species	2,245	3,740	19,312	20,474
Flounder and sole	2,159	2,039	11,447	10,232
Herring	904	485	10,334	4,161
Other	40	223	419	700
Total	5,348	6,487	41,512	35,567
<i>(Short Tons)</i>				
<i>Industrial Products:</i>				
Fish meal, fish solubles, and similar products	8,191	9,070	31,910	22,047
/Shipments from the Faroe Islands and Greenland direct to foreign countries not included.				

Denmark's exports of fish meal, fish solubles, and similar products in January-June 1962 were 44.7 percent greater than in the same six months a year earlier.

During June 1962, Denmark's exports of fish meal, fish solubles, and similar products were 9.7 percent below the amount shipped out in the same month of 1961. The principal buyers were the United Kingdom and West Germany.



Ecuador

JAPANESE FISHING VESSEL BASED IN ECUADOR TO FISH TUNA AND SHRIMP:

According to a Japanese report, the Japanese fishing vessel Daishin Maru No. 7 is scheduled to be dispatched sometime this year to Ecuador where it will engage in shrimp and skipjack tuna fishing. Reportedly, the Daishin Maru will be part of the fleet of Japanese vessels to be based in Ecuador, the nucleus of which will consist of medium trawlers from the port of Shioigama, Miyagi Prefecture, but it will work independently of this trawler fleet. (Suisan Keizai Shimbun, August 22, 1962.)

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JAPANESE TUNA VESSEL SEIZED:

The 480-ton Japanese tuna vessel Seisho Maru No. 5 was reported to have been arrested by an Ecuadorean Navy patrol vessel on August 19, 1962, while fishing off Ecuador. The Seisho Maru reportedly was being escorted to San Cristobal in the Galapagos Islands for possible trial on suspicion of having violated Ecuadorean territorial waters. (Suisan Tsushin, August 24, 1962.)



El Salvador

IMPORT DUTY ON UNITED STATES CANNED SALMON AND CANNED MACKEREL UNCHANGED:

The preferential import duty on United States canned salmon and canned mackerel approved by the Legislature of El Salvador on August 13, 1962, is: \$5 per 100 kilograms (about 2,27 U. S. cents a pound), plus 6 percent ad valorem, according to a San Salvador newspaper. The new rate of duty is the same as that provided by the 1937 Trade Treaty between the United States and El Salvador which was terminated August 9, 1962. (United States Embassy, San Salvador, August 17, 1962.)



Ethiopia

RED SEA FISHERY RESOURCES NOT FULLY USED:

Ethiopia has not yet developed her rich fishing grounds in the Red Sea. Possibilities exist for starting local industry to process

Ethiopia (Contd.):

tuna, sardines, snapper, shrimp, and spiny lobsters. During the 12 month period ending September 1961, total landings of fish and shellfish in Ethiopia amounted to only 11,000 metric tons. Sardines and anchovies made up over 90 percent of the catch and were used mainly for dried fish and fish meal. (United States Consulate, Asmara, June 26, 1962.)



France

FRENCH FISHERMEN PROTEST IMPORTS OF MOROCCAN FROZEN SARDINES:

An oversupply of sardines in French ports in the summer of 1962 caused French fishermen to protest against imports of frozen sardines from Morocco. In one port (Breton), demonstrators destroyed 40 tons of a 150-ton cargo of frozen sardines brought to France aboard a Moroccan ship.

Therefore, shipments of frozen sardines to France have been suspended by Morocco following the violent protests of Breton fishermen. An unusually abundant sardine catch off the Breton Coast is reported to have glutted the French market and to have caused prices to collapse. Morocco has an arrangement of duty-free quotas for many products exported to France, including all types of sardine products. (United States Embassy, Rabat, July 27, and August 10, 1962.)

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JAPANESE FIRMS EXPORT FROZEN TUNA TO FRANCE:

Two Japanese firms in July 1962 concluded contracts to export a total of 418 metric tons of frozen tuna (consisting of yellowfin, albacore, and bluefin) to France. While these quantities are small, they are the first shipment of frozen tuna destined for France this year, and it is expected that frozen tuna exports to that country will reach close to 3,000 metric tons by the end of this year.

Other Japanese firms are also negotiating with French firms to export frozen tuna to France, which reportedly is interested in increasing imports of that product for canning purposes. (Suisan Keizai Shimbun, July 22, 1962.)

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FIRST INTERNATIONAL "FISH FAIR" HELD:

France held its first "Biennale Internationale des Peches" (International Fisheries Biennial), May 25-June 3, 1962, at the Port of Lorient. The event took place in a covered structure called the "Paladium" measuring about 33,000 square feet, as well as along the quays of the sea fishing port which is located at the northern end of the Bay of Biscay.

The event was sponsored by the Lorient Chamber of Commerce as a means of stimulating the French fishing industry, to increase the consumption of fish in France, and to alert the industry to the increased competition it can expect from other nations in the Common Market group. France's per capita consumption of fishery products ranges from 26 to 28 pounds and is considered below that of other European nations.

The "Fish Fair" was rated the most important ever organized by the French fishing industry. Its aim was to group together all the activities of the fishing and related industries, from fishing boats and equipment to the meal and oil industries, packing industries, and distribution channels. The 600 stands inside the covered structure were occupied by some 152 participants. All were French except eight. Among the 8 foreign firms, there were 2 from Sweden, 2 from Holland, 1 from Denmark, 1 from Spain, and 1 from Belgium.

The "Fish Fair" was reported not to have attracted as many general visitors as some other commercial fairs held in the larger French cities, but it was well attended by people representing France's fishing industry. Many contracts and good business transactions were made, and the participants were reported to have been satisfied with the results.

It was reported, however, that the French press carried strong criticism about the fact that outside of fishing equipment, which was well presented, very little was shown relating to industries involved in the distribution of fish. The lack of such representation was said to reflect the present situation in France where the canning, freezing or icing, and distribution of fish were said to be poorly organized. According to the French press, the Biennale at least helped draw attention to that problem.

A number of various conferences and lectures were programmed for the "Fish Fair." May 28 was "Foreign Commerce Day," May

France (Contd.):

30 "Consumers' Day," June 1, "Fishing Fleet Day," and June 2 "Fish Dealers' Day." At the "Foreign Commerce Day," the Canadian Vice-Minister of Fisheries, the Assistant Director of the Moroccan Fisheries Office, the Director of Industrialization in Senegal, and the Director of a fishery magazine in Athens, Greece, all spoke of fishing practices and techniques in their own countries. The Directeur General of the French Centre National du Commerce Exterieur, who presided on "Foreign Commerce Day," emphasized the necessity to help underdeveloped countries, technically and financially, to organize their own fishing. Subsequent incidents involving the deliberate destruction of Moroccan-caught sardines landed at French ports were considered significant.

The consumption of fish in France is expected to increase in the near future, and it is believed that frozen fishery products will take an important part of the market. If not soon produced in France, increasing quantities of frozen fishery products could conceivably be imported from foreign countries. A French press article stated that "no display of frozen fish products was shown at this first biennial since so very few foreign firms participated. No American firm participated but it is hoped that the next biennial will arouse more interest on the part of American and other foreign firms." (United States Embassy, Paris, August 18, 1962.)

**Gabon****STATUS OF FISHERIES, 1961:**

The fishing industry of Gabon is relatively small. In 1961, the five local fishing companies produced 1,200 metric tons of fish valued at US\$530,000. Although the fishery resources off the Gabonese coast are reported

to be large, substantial imports of fish are necessary to meet local needs. (United States Embassy, Libreville, August 1, 1962.)

**Ghana****SOVIETS DELIVER FISHING VESSEL TO GHANAIAN FIRM:**

A Soviet-built fishing vessel arrived in Tema, Ghana, late in August 1962 for delivery to a Ghanaian firm. Newspapers in Ghana reported that the ship cost £G30,000 (\$84,000), has crew facilities for 12, and is capable of remaining at sea for 9 days. A group of Soviet technicians accompanied the ship. They will train Ghanaian crewmen in fishing methods, and it is believed that the training will be mainly in herring fishery techniques.

Russian fishing crews and vessels have been hired in the past on contract by the Ghanaian firm that received the new vessel. The firm acts as the agent for Prodintorg of Moscow and handles provisions and goods for the Russian organization. (United States Embassy, Accra, August 28, 1962.)

Note: See *Commercial Fisheries Review*, Nov. 1961 p. 48.

**Republic of Honduras****SHRIMP EXPORTS TO UNITED STATES DECLINE:**

Total 1961 fishery products exports by the Republic of Honduras amounted to 125 metric tons, valued at 235,814 lempiras (US\$117,908). All but about 10 percent of the total was shipped to the United States--principally frozen shrimp and frozen spiny lobster tails. The remainder went to El Salvador.

Total Fishery Products Exports by Republic of Honduras, 1961

Product	Total Fishery Products Exports by Republic of Honduras, 1961					
	To United States			To El Salvador		
	Quantity	Value		Quantity	Value	
	Metric Tons	Lempiras	US\$	Metric Tons	Lempiras	US\$
Fish, including live fish, fish meat & edible fish eggs, fresh, refrigerated, or frozen (includes aquarium fish)	-	-	-	1/	200	100
Fish, including fish meat & edible fish eggs, dried, salted, smoked, or cured, but not otherwise prepared	-	-	-	11	11,575	5,788
Crustaceans & mollusks, fresh, refrigerated, frozen, salted, dried, smoked, cured, or cooked (except shrimp)	17	29,891	14,946	1/	40	20
Shrimp, fresh, refrigerated, frozen, salted, dried, smoked, cured, or cooked	97	194,108	97,054	-	-	-
Total	114	223,999	112,000	11	11,815	5,908

1/Less than 1 metric ton.

Notes: (1) Values converted at rate of 2.00 lempiras equal US\$1.

(2) Fishery products were exported only to the United States and El Salvador.

Republic of Honduras (Contd.):



The 1961 exports of frozen shrimp from that country to the United States were below the previous year, and were the lowest since 1958 when they were at a record high. Shrimp landings in Honduras during 1961 totaled only a little more than 200,000 pounds, practically all of which was shipped to the United States.

United States frozen shrimp imports from Honduras during the past several years were: 362,000 pounds in 1960; 271,000 pounds in 1959; and a high of 836,000 pounds in 1958 (when they were first shown separately from other countries). In 1958, the Honduras shrimp landings amounted to nearly one million pounds, with the bulk coming to the United States. The sharp downward trend in shrimp fishing activity in Honduras seemed to stem from certain provisions in the Fishing Law enacted during 1959, which apparently discouraged foreign investment in the Honduras shrimp fishery. (*Comercio Exterior*, 1961.)

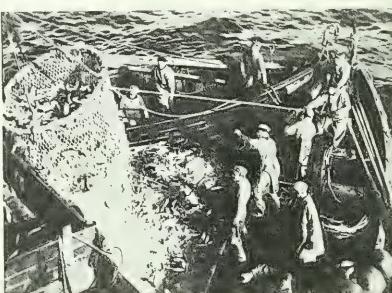
Note: See *Commercial Fisheries Review*, July 1962 p. 65.



Iceland

FISHERIES TRENDS, EARLY AUGUST 1962:

Summer Herring Fishery: Less north coast herring was salted this summer than in the previous summer, even though 1962 north coast herring landings were at a record level. North coast herring landings totaled 189,806 metric tons by August 5, 1962, as compared with landings of 160,976 tons by the same date in the previous year. A total of 34,464 tons of the 1962 catch was salted by



Brailing a good catch of herring.

Iceland (Contd.):

early August, while 46,286 tons of the north coast herring catch was salted by the same time last year. Most of the remainder of the 1962 catch was processed into fish meal and oil.

Although hampered at times by bad weather, the herring fishery was rated very good. According to the Icelandic weekly herring report of August 19, 1962, a total of 226,195 metric tons of herring had been caught to that date compared with 200,263 tons by the same time the previous year.

Herring Salting: The amount of herring salted by August 1962--43,736 tons--was the greatest since 1939 except for the summer of 1961 when it was boosted up to 48,151 tons. But herring salting was stopped by August 19 as summer herring contracts totaling 312,000 barrels had been filled. Those contracts consisted of: 128,000 barrels to Sweden; 80,000 barrels to the U.S.S.R.; 55,000 barrels to Finland; 12,300 barrels to the United States; 8,700 barrels to West Germany; 6,700 barrels to Norway; 4,500 barrels to Denmark; and about 17,000 barrels for local use, including canning.

Herring salting was resumed after the announcement on August 8, 1962, that contracts had been signed with the Soviet Union and Israel for salted north coast herring. The announcement temporarily ended the annual speculation and unrest over the Soviet herring contract. The contract with the Soviet Union was for 80,000 barrels of salted north coast herring at a "somewhat higher price than last year." Last year, contracts with the Soviet Union for both north and south coast herring amounted to 152,000 barrels. The new contract with Israel calls for 6,000 barrels of specially-cured herring. Work had not yet begun on the Israeli contract. There were some prospects of additional contracts with Sweden or Finland. North coast contracts for salted herring total 320,000 barrels.

The Herring Fisheries Committee had not yet signed any contracts for south coast salted herring. There was an air of pessimism over their prospects. Considerable discussion had taken place over the future of salted herring markets in view of declining consumption. Even the Conservative press attacked the State Herring Board's sales system and called for a reorganization, as well as an intensive search for new markets.

Fishery Trade with Soviet Bloc: In response to Icelandic newspaper editorials which emphasized the disadvantages of trade with the Soviet Bloc nations, the Icelandic Freezing Plants Corporation stated that trade with the Bloc has been beneficial to the freezing plants, as well as to Iceland's fishing industry as a whole. The statement generated a new wave of democratic press protests against such trade. The main theme of the protests was that because fish products are sold on a barter basis to the Bloc countries, the Icelandic consumer is forced to buy inferior goods at high prices. The press also pointed out that it is extremely dangerous for Iceland to be in a position where Icelandic trade is subject to the whims of Soviet trade decisions, which are often based on political considerations.

Visit of Russian Vessel: A large 3,250-ton Russian trawler visited Reykjavik in connection with a joint research project on size of mesh. Experts who visited the vessel were impressed with its freezing and reduction plant.

Scandinavian Fisheries Conference: Iceland sent a strong delegation of nine representatives to the Scandinavian Fisheries Conference in Trondheim, Norway, in the middle of August. It is understood that much of the Conference discussion was about new fisheries conditions being created by the Common Market (European Economic Community). The Icelandic Minister of Fisheries discussed in a press interview the resolution of the Scandinavian Fisheries Ministers Conference. The essence of the resolution was that the Scandinavian countries should have a hand in formulating European Economic Community fisheries policy, because the Scandinavian countries would, on joining, account for more than half of the fish production of the expanded Common Market. (United States Embassy, Reykjavik, August 10 and 24, 1962.)

**Japan****FROZEN TUNA EXPORTS TO
UNITED STATES AND EUROPE,
APRIL-JULY 1962:**

The Japan Frozen Foods Exporters Association has compiled data showing frozen tuna exports to the United States and Europe for April-July 1962. (Suisan Tsushin, August 9, 1962.)

Japan (Contd.):

Table 1 - Japanese Frozen Tuna Exports to United States, April-July 1962

Product and Source	1962	1961	1960
.....(Short Tons).....			
Albacore:			
Japan proper:			
Round	2,848	3,741	4,061
Loin	362	415	285
Transshipments	2,445	1,715	561
Total	5,655	5,871	4,907
Yellowfin:			
Japan proper:			
Gilled and Gutted:			
With head	13,990	10,481	13,031
Without head	251	-	63
Loin	3,447	942	970
Fillet	2,269	315	68
Transshipments	6,156	7,787	4,099
Total	26,113	19,525	18,231
Big-eyed:			
Japan proper	1,490	137	62
Skipjack:			
Japan proper	246	-	71
Bluefin:			
Japan proper	213	-	220
Total exports from Japan proper	25,116	16,031	18,831
Total transshipments	8,601	9,502	4,660
Combined total exports	33,717	25,533	23,491

Table 2 - Japanese Frozen Tuna Exports to Europe & Africa, April-July 1962

Destination	1962	1961	1960
.....(Metric Tons).....			
Italy	9,345	7,777	8,734
Yugoslavia	3,034	3,506	4,804
France	418	-	4,160
Ghana	393	-	-
Czechoslovakia	192	656	-
Other countries	5	1,029	528
Total	13,387	12,968	18,226

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VALUE OF FROZEN AND CANNED TUNA EXPORTS IN FIRST HALF OF 1962:

Japan's exports of frozen tuna to the United States in the first 6 months of 1962 were up 72.1 percent in value as com-

pared with the same period in 1961. For the same period the export value of canned tuna dropped 17.6 percent.

The United States took 62.6 percent of Japan's total frozen tuna exports during the first half of 1962 as compared with 50.7 percent in the same period of 1961. The United States ratio of Japan's total canned tuna exports was 69.8 percent as against the same period in 1961 when it was 65.7 percent.

The marked improvement in Japan's balance of trade during the first half of 1962 was expected to remain good until the close of the year, with indications that exports to the United States of most major commodities would continue good for the remainder of 1962. (United States Embassy, Tokyo, August 24, 1962.)

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NINTH SALE OF CANNED TUNA IN BRINE FOR EXPORT TO U. S.:

The ninth sale of canned tuna in brine for export to the United States was approved by the Canned Tuna Sales Standing Committee of the Japan Canned Foods Exporters Association at the August 21, 1962, meeting of the Association. The Committee approved the sale of 200,000 cases (48 No. $\frac{1}{2}$, 7-oz., cans) of canned tuna in brine, consisting of 135,000 cases of white meat tuna and 65,000 cases of light meat tuna. Export prices per case remain unchanged: white meat US\$10.40, light meat US\$7.80, f.o.b. Japan.

Japanese exports of canned tuna in brine to the United States up to and including the ninth sale totaled 1,943,000 cases, consisting of 1,103,000 cases of white meat tuna and 840,000 cases of light meat tuna. Reportedly, there now remains only 257,000 cases of canned tuna in brine yet to be exported to the United States before the export quota established by the Japan Canned Foods Exporters Association is filled. (Suisan Tsushin, August 22, 1962.)

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EXPANSION OF FROZEN TUNA EXPORTS TO UNITED STATES UNDER STUDY:

The Japanese Export Frozen Tuna Producers Association has undertaken an investigation for the purpose of expanding exports of frozen tuna to the United States from Japan proper. According to the Association, exports of frozen tuna to the United States from Japan proper for April, May, and June 1962 were exceedingly good, and, as of July 15, a total of approximately 20,000 shorttons of the 35,000-ton export quota for yellowfin tuna had been used. This left only 15,000 short tons of yellowfin available for export for the remainder of the fiscal year (to March

Value of Japan's Exports of Selected Fishery Products, January-June 1961-62						
Product	Jan.-June 1962		Jan.-June 1961			
	U.S.	Total	U.S.	Total	U.S.	
(In US\$1,000)	%		(In US\$1,000)	%		
Tuna, frozen	16,138	25,760	62.6	9,375	18,485	50.7
Tuna, canned	6,932	9,936	69.8	8,410	12,797	65.7
Pearls, worked	10,423	22,192	47.0	8,065	17,063	47.3

Note: Exports are valued f.o.b. Japan.

Source: Customs Bureau, Japanese Ministry of Finance.

Japan (Contd.):

1963) and the Association feels this amount to be inadequate.

One element in the Producers Association feels that the separate quota of 30,000 short tons of albacore for export to the United States from Japan proper should be combined under one over-all yellowfin-albacore export quota. Their reasoning at the present time is that it appears the albacore export quota will not be completely utilized. As of July 15, albacore exports to the United States reportedly totaled about 4,000 short tons.

This move, if it develops, is expected to be opposed strongly by those groups that hold allocations of frozen albacore export quotas, for their allocations until now have been based on past performance records, and they do not wish to see this system replaced with one which completely ignores their hard-won export quotas.

Exports of frozen tuna to the United States had begun to decline in July and this development was expected to delay settlement of the yellowfin quota expansion issue. However, the need for increasing the yellowfin export quota is acknowledged by the Association, (Suisan Keizai Shim bun, July 19, 1962.)

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EX-VESSEL PRICE FOR FROZEN YELLOWFIN TUNA DROPS:

After July 1962, the Japanese export price of frozen tuna for shipment to the United States declined. Because of this, the Japanese landed or ex-vessel price of frozen tuna at Japanese ports dropped markedly. For instance, the ex-vessel price for yellowfin of 20-100 pounds dropped to ¥110 per kilo (US\$277.20 a short ton) on August 18 at Yaizu. Later it dropped to ¥108 (\$272.20 a short ton), which is said to be the lowest for this year and some ¥30 a kilo (\$75 a short ton) lower than at the time of the best market. The reason for the drop is attributed to increased arrivals of frozen tuna in August, and particularly to the cautious commitment and sales policy of the frozen tuna exporting firms. (Japanese periodical, August 21, 1962.)

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TUNA EX-VESSEL PRICES AT TOKYO:

The following ex-vessel prices were paid on August 22, 1962, for 393 metric tons of

tuna and spearfish landed in Tokyo by two Japanese long-line vessels. (Suisan Keizai Shim bun, August 24, 1962.)

Tokyo Ex-Vessel Tuna Prices, August 22, 1962		
Product	Yen/Kg.	Price US\$/Short Ton
Yellowfin (gilled & gutted):		
20-80 pounds	102-110	257-277
Over 80 pounds	90-91	227-229
Albacore	140	353
Fillets:		
Yellowfin	102-111	257-280
Big-eyed	105-106	264-267

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COSTS FOR EXPORTING FROZEN TUNA TO EUROPE FROM JAPAN PROPER:

The European tuna market is reported to have become particularly attractive to Japanese tuna exporters in view of the price decline in the United States tuna market. According to the Japanese periodical Suisan Tsushin of July 25, 1962, the present price of frozen yellowfin tuna (dressed with tail) exported to Europe from Japan proper is about US\$380 a metric ton at port of destination. Deducting 3 percent for broker's commission and \$55-60 a ton for transportation cost (unscheduled freighter rates^{1/}) from this figure leaves a balance of \$310-315, which would be the Japan f.o.b. price per metric ton. Further if allowances of \$20 per metric ton for handling costs up to time of shipment and a maximum of 10-percent loss for processing (i.e., deheaded, gilled and gutted frozen tuna landed by clippers) are made, the new adjusted price amounts to \$232-239 a short ton. This adjusted price is higher than the present Tokyo ex-vessel price of \$222 a short ton for gilled and gutted frozen yellowfin, which allows a good margin of profit for Japanese exporters exporting frozen yellowfin tuna to Europe from Japan proper.

The Suisan Tsushin adds that frozen skipjack tuna were recently exported to Italy from Japan proper on a trial basis. Reportedly, they were exported for \$310 per metric ton, c.i.f. Italy. (Suisan Tsushin, August 25, 1962.)

^{1/}Scheduled freighter rates are quoted at \$77 a metric ton by the Suisan Tsushin.

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ATLANTIC OCEAN TUNA FISHERY AND PRICES FOR ATLANTIC FROZEN TUNA, AUGUST 1962:

About one-third of the nearly 80 Japanese long-line tuna vessels operating in the Atlantic Ocean were reported to be fishing in

Japan (Contd.):

the Caribbean Sea in early August 1962. Late in July, a number of the vessels found a new fishing ground for albacore around Puerto Rico. Catch of albacore (vessels of 350-500 gross tons averaged 7 metric tons per day in early July) was reported to have declined in August to about 3 metric tons per day. The main fishing grounds had shifted southward to the offshore waters near the Guianas.

Elsewhere in the Atlantic Ocean, Japanese vessels operating off the West African coast are reported to be averaging 3-4 metric tons of fish per vessel per day. Catch was reported to consist of 60 percent yellowfin and 40 percent bigeyed. The yellowfin tuna catch was better than last year off West Africa.

Export prices of Japanese Atlantic Ocean frozen tuna for shipment to the United States (Dakar delivery) in early August were reported: albacore US\$340 a short ton; yellowfin \$290 a ton; big-eyed \$230 a ton.

Prices of frozen tuna exported to Italy, at Italian ports of destination, in early August were reported: albacore \$450 a metric ton; yellowfin \$380 a ton; big-eyed \$350 a ton. These prices include brokers' commission. (Suisan Tsushin, August 23, 1962.)

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SPECIAL COMMITTEE FORMED TO STUDY TUNA PROBLEMS:

Japanese tuna industry members held an informal conference at Tokyo on August 24, 1962, to consolidate industry's views concerning the forthcoming Japan-United States tuna meeting scheduled to be held at Tokyo, beginning October 9. Upon the recommendation of the President of the Japan Fisheries Society, the group decided to establish a special committee within the Japan Fisheries Society to study problems relative to the tuna industry in view of growing international tuna problems. The committee's first assignment is to prepare a paper for submission to the Japanese Government summarizing industry's views concerning the October tuna meeting with the United States.

The following organizations were represented at this meeting: Japan Fisheries Society, Canned Tuna Exporters Association, Canned Foods Exporters Association, Tokyo Canned Tuna Sales Company, Frozen Foods Exporters Association, Export Frozen Tuna

Producers Association, Export Frozen Tuna Sales Company, Federation of Tuna Cooperative Associations, and the National Federation of Fishery Cooperatives. (Minato Shimbun, August 25, 1962.)

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TUNA FISH-FINDER DEVELOPED:

A Japanese fish detector manufacturer with offices in Numazu, Shizuoka Prefecture, is reported to have developed a fish detector (called "Televi-graph De Luxe") exclusively for tuna detection. The detector is said to detect albacore tuna to a depth of 985 feet, clearly reproduce images of individual fish, and accurately record plankton masses and boundaries of water masses. Its vertical depth range is said to exceed 9,800 feet. (Suisan Keizai Shimbun, August 15, 1962.)

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OVERSEAS TUNA BASES TRYING TO ACQUIRE MORE VESSELS:

As the tuna catch quota has been increased by Japanese authorities by 20 percent in mother-ship-type operations and by 50 percent at the bases in American Samoa and Espirito Santo, respectively, additional vessels are required at all those bases. Further, the port of Penang in Malaya has acquired a transhipment quota of 6,000 tons of frozen tuna, and plans are stepped up in establishing new bases at Fiji, Tahiti, New Caledonia, and Madagascar.

All of the fishing companies concerned in those operations and projects are trying to acquire additional vessels of up to 180 gross tons in size. It is reported that representatives of the firms concerned are seen at all principal Japanese tuna ports. (Japanese periodical, August 21, 1962.)

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REVISION OF TUNA VESSEL FISHING REGULATIONS PLANNED:

The Japanese Fisheries Agency is reported to have revealed its intention to revise existing regulations governing operation of medium- and distant-water tuna vessels and portable-vessel-carrying tuna motherships, based on the request submitted by the National Federation of Japan Tuna Fisheries Cooperative Associations. Reportedly, the Agency intends to make the following changes in the existing regulations:

Japan (Contd.):

1. Licensed tuna fishing vessels will be permitted to transfer their catches at sea, with certain exceptions.

2. Fishing vessels operating independently will be permitted to unload their catches at transshipment bases in the Pacific Ocean for shipment to Japan proper. However, they will not be allowed to transship their catches for export purposes.

3. Restrictions on types of fishing vessels authorized to land catches at overseas bases or authorized to fish for motherships will be removed.

4. Conditions and restrictions currently governing the licensing of tuna fishing vessels, such as retiring a vessel before constructing a new vessel, will be removed, with certain exceptions. (Present regulations require that more than 50 gross tons be put up as replacement tonnage when constructing a new vessel.)

5. Regulations will be revised to strengthen control over unlicensed fishing vessels.

6. In the assignment of vessels to overseas fishing bases, the provision in the regulations which grants priority to newly-licensed fishing vessels will be deleted. (Suisan Keizai Shimbun, August 14, 1962.)

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TUNA LONG-LINER FLEET TRENDS:

Data compiled by the Japan Export Frozen Tuna Producers Association show that, as of July 1, 1962, the number of Japanese tuna distant-water long-liners totaled 445 vessels.

Composition of Japanese Distant-Water Tuna Long-Liner Fleet		
Size Range (Gross Tons)	No. Vessels	Total Gross Tonnage
170-250	100	23,605
250-350	169	51,701
350-450	88	34,099
450-550	50	24,292
550-750	16	10,415
750-1,000	6	5,271
Over 1,000	16	21,032
Total	445	170,415

The data also revealed that between January-June 1962, a total of 49 new tuna long-liners (totaling 16,759 gross tons) were constructed. In 1961, 116 long-liners (totaling 38,820 gross tons) were constructed; in 1960,

78 vessels (totaling 32,274 gross tons) were built.

Examination of data for January 1960-June 1962 shows that the majority of the long-liners constructed during that $2\frac{1}{2}$ -year period were under 250 tons gross, followed by vessels in the 250-350 ton category. Also, 72 percent of the vessels under 250 tons gross and 60 percent of those in the 250-350 ton category were constructed after 1960. In contrast, only 3 vessels in the 550-1,000 ton class have been constructed since January 1960. (Suisan Tsushin, August 17, 1962.)

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STERN TRAWLER TO FISH FOR COD IN NORTHWEST ATLANTIC:

A license permitting temporary trawling operations in the Northwest Atlantic by the stern trawler Aoi Maru No. 2 (1,138 gross tons) was issued by the Japanese Fisheries Agency to one of the three Japanese fishing firms which applied for such permits during early August this year. The vessel was scheduled to leave Nagasaki for fishing in the vicinity of Newfoundland, using St. Pierre (a French free port) as its base of operations.

The fishing firm that was granted the permit is a subsidiary of a Japanese marketing firm, which has shown considerable interest in supplying cod for the St. Pierre fish stick processing industry, and also exporting cod to the United States and Europe.

It was reported that the plan was stimulated by a sharp rise in the consumption of cod in the United States and Latin American countries, and was not to be regarded as a substitute for any failure in Japanese trawling operations off Africa's Atlantic Coast. (Japanese periodical, July 24-30, 1962.)

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TRAWLING IN NORTHWEST ATLANTIC EXPECTED TO START EARLY IN OCTOBER 1962:

The Japanese trawler Aoi Maru (1,134 gross tons) was expected to start fishing in the Northwest Atlantic off the coast of Greenland early in October 1962. The vessel left Japan August 20, 1962, and was expected to arrive on the fishing grounds October 10, 1962. Catches (probably frozen) were to be transshipped to the United States from St. Pierre Island or Trinidad. The Japanese company that operates

Japan (Contd.):

the Aoi Maru maintains a branch office in New York City. Their New York branch office has arranged sales contracts with two fish processing firms in Boston, Mass., for fish transshipped by the Aoi Maru.

The Japanese Fisheries Agency is expected to approve the license application submitted by another Japanese fishing company for permission to fish in the Northwest Atlantic. (Fisheries Attaché, United States Embassy, Tokyo, September 14, 1962.)

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STERN TRAWLER TO FISH OFF WEST AFRICA:

A large Japanese fishing firm's stern trawler Akebono Maru No. 50 (1,500 gross tons) left Japan in August 1962 for West African waters and was scheduled to arrive at the fishing grounds off Las Palmas Island in early September.

The stern trawler is the first of the firm's trawlers to operate in the Atlantic Ocean. Another of the firm's trawlers, Akebono Maru No. 53 (1,500 gross tons), currently operating in the Indian Ocean northwest of Australia, is also expected to proceed to the Atlantic Ocean. (Shin Suisan Shimbun Soku-ho, August 22, 1962.)



Republic of Korea

CONTRACTS FOR LOAN OF \$120 MILLION TO BUILD FISHING VESSELS:

Representatives of an Italian-French combine signed a contract with the Government of the Republic of Korea on August 8, 1962, to provide a \$120 million loan for the development of Korea's fishing industry. Certain conditions must be met before the contract becomes binding and some details of the contract still have to be negotiated.

New fishing vessels (729) with a total tonnage of 118,000 tons are to be built with the loan. Most of the vessels are to be built in Europe. Engines and other equipment (except lumber) will be supplied from Europe for the vessels to be built in Korea. All supplies are to be delivered to European ports. As a result of the agreement, South Korea would nearly double its fishing fleet.

The Italian-French combine is to train Korean fishermen and technicians and assist in marketing Korean fishery products throughout the world. It is predicted that the project will boost the annual Korean catch to over one million metric tons and the value of the annual catch to US\$70 million. Modern packing facilities would be created at six Korean ports. In 1961, the Korean total catch amounted to 412,000 tons (including 37,000 tons of seaweed) with a value of \$29 million.

The contract will go into force after (1) approval of the Korean, Italian, and French Governments; (2) the issuance of credit guarantees by the Italian and French authorities; (3) the deposit of a down payment of 10 percent by the Koreans in Europe; and (4) the deposit of drafts as stipulated in the contract in a bank designated by the Contractor. Further details of the work to be done under the contract are to be negotiated within three months. The combine is to submit for approval by Korea a plan for first priority work. Prices, to be agreed upon by the two parties, are to be "based upon international competitive market prices."

Terms of the contract call for advance payment of 20 percent of the loan, and half of that must be paid in cash in U.S. dollars on specified dates before work on the new vessels begins. Then ten percent of the price of each vessel or unit of equipment is to be paid in U.S. dollar drafts when the unit is delivered to a European port. Eighty percent of the price of each vessel or unit of equipment is to be paid in 7 years in semiannual installments, with an annual interest rate of 5.5 percent. This payment is to be in drafts of U.S. dollars "issued by the Contractor to its own order or to the order of a Financing Institute to be designated by the Contractor." (United States Embassy, Seoul, August 10, 1962.)

The present agreement is a revision of the Italo-South Korean agreement of February 12, 1962.



Morocco

CANNED FISH PACK AND EXPORTS, 1961/62 SEASON:

The canned fish pack in Morocco during the 1961/62 canning year (June 1-May 31) showed a moderate increase over the previous year.

Morocco's Canned Fish Pack, 1961/62 and 1960/61		
Products	1961/1962	1960/1961
Sardines or pilchards . . . . .	..... (Cases) .....	..... (Cases)
Tuna	2,014,878	1,984,572
Other fish (incl. mackerel) . . .	171,967	130,988
Total	315,265	215,891
Total	2,502,110	2,331,451

Although Morocco's exports for the 1961/62 canning year set an all-time high, the sardine industry is in difficulty. After having disappeared from the waters off Safi during July and most of August 1962, the sardine returned but the quality of the catch was reported to be very poor from Casablanca south. In addition, Moroccan sardine exports face difficulties in their major market in France.

The Government has endorsed "Operation Tuna," a plan to promote tuna fishing to offset the poor results being obtained with sardines. Success will depend in part on whether or not arrangements can be made to contract for freezing and factoryships to work together with Moroccan fishing vessels on the high seas. (United States Embassy, Rabat, September 7, 1962.)

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Morocco (Contd.):

FISHING LIMITS EXTENDED
TO 12 MILES:

The Government of Morocco on July 27, 1962, announced the extension of Moroccan fishing limits from 6 to 12 miles. The an-



nouncement included the statement that the new measure would permit the Government to reinforce its surveillance of its territorial waters and to fight with greater effect against the "systematic ravages" to Moroccan fishing waters. The extension will make it impossible for French and Portuguese fishermen to continue catching sardines off the Moroccan coast. (United States Embassy, Rabat, August 10, 1962; *Le Marin*, fishery periodical, August 3, 1962.)



Netherlands

JAPANESE CANNED TUNA PRICES,
MID-SEPTEMBER 1962:

In mid-September 1962, the wholesale prices of Japanese canned tuna in the Netherlands were as follows:

Tuna in "dressing" sauce (48 6 1/2-oz. cans)	\$6.70 per case
Tuna in jelly (48 7-oz. cans)	\$6.40 per case

Only a small quantity of Japanese canned tuna is being sold in the Netherlands. The market for canned salmon in the Netherlands is much larger than the market for canned tuna. (United States Embassy, The Hague, September 14, 1962.)



Nigeria

FISH CATCH FROM LAKE CHAD:

The estimated annual catch from the Nigerian sector of Lake Chad is 10,000 metric

tons. The annual catch yields about 4,800 tons of dried fish which when marketed has a retail value of about \$4.2 million. (Federal Fisheries Service, Lagos, January 1962.)

Note: See also under "Chad."



Norway

EXPORTS OF CANNED FISH,
JANUARY 1-JUNE 23, 1962:

Norway's total exports of canned fish during the period January 1-June 23, 1962, were 14.5 percent greater than in the same period of 1961. All of Norway's important canned fish products, except soft herring roe, were exported in greater quantity in 1962. Exports of canned smoked brisling were up 22.8 percent and exports of canned smoked sild were up 19.7 percent.

Product	1962		1961	
	Metric Tons	1,000 Lbs.	Metric Tons	1,000 Lbs.
Smoked brisling	2,393	5,276	1,948	4,295
Smoked small sild	6,543	14,425	5,472	12,063
Kipper herring	2,422	5,340	2,169	4,782
Soft herring roe	575	1,267	587	1,294
Sild delicatessen	221	487	146	322
Other canned fish	1,709	3,767	1,718	3,787
Shellfish	920	2,028	870	1,918
Total	14,783	32,590	12,910	28,461

1/Preliminary.

During January-May 1962, Norway's total exports of canned fish showed an increase of 11.3 percent in quantity and 15.2 percent in value over exports in the same period of 1961, due mainly to an increase in exports to the United States.

Year	Norway's Total Exports of Canned Fish, January-May, 1961-62 1/			
	Metric Tons	Quantity		Value Million N. Kr. Million US\$
		1,000 Lbs.	Million N. Kr.	
1962	12,872	28,378	63.84	8.9
1961	11,565	25,496	55.44	7.8

1/Preliminary.

The United States was the leading buyer of Norwegian canned fish during January-May 1962 with 6,527 metric tons valued at N. krone 33.2 million (US\$4.6 million) as compared with 4,509 tons valued at N. krone 23.7 million (US\$3.3 million) during the same period of 1961. Other important markets for Norwegian canned fish in 1962 were Great Britain, Australia, South Africa, and Canada.

The brisling catch on the west coast has been good this year, although catches declined in July. As of July 21, 1962, the brisling pack totaled 238,763 cases and the small sild pack amounted to 222,130 cases, as compared with 298,522 cases of brisling and 162,219 cases of small sild by the same date last year. (Norwegian Canners Export Journal, August 1962.)

* * * * *

Norway (Contd.):

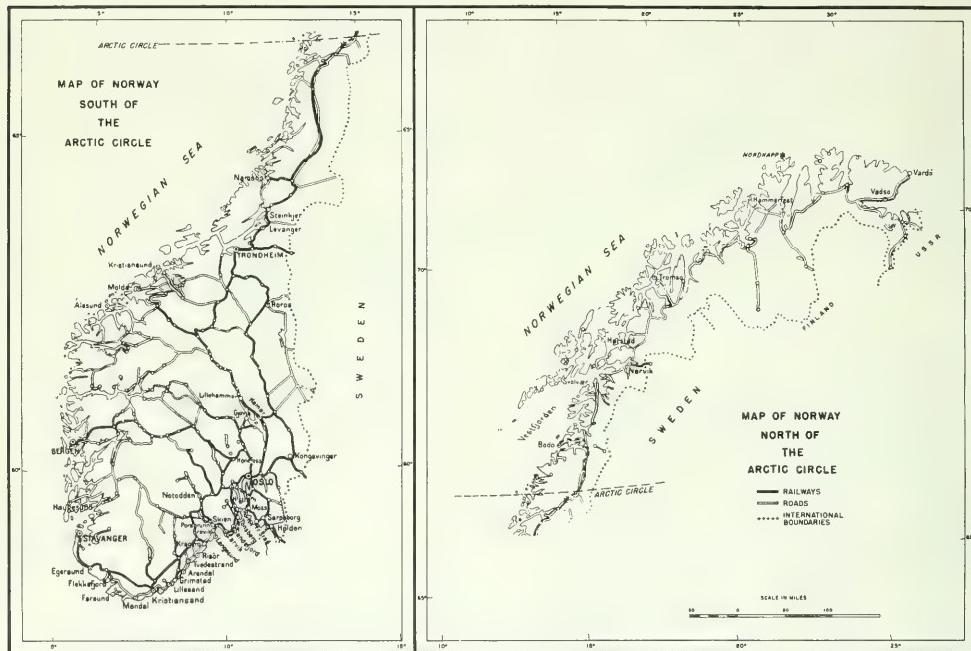
TUNA CATCH IN 1962 EXPECTED TO BE LESS THAN IN 1961:

Norwegian fishermen as of early September had landed about 5,400 metric tons of tuna this year. The tuna fishing season in Norway is from July–October. A total of 160 purse-seiners manned by 1,700 fishermen are engaged in the main tuna fishery off West Norway. Others were fishing for tuna off the Nordland coast.

The tuna catch will probably increase before the season ends, but it is doubtful if it

The tuna catch and the number of vessels engaged in the fishery fluctuate considerably from year to year. Norwegian fishermen began purse-seining for tuna in 1948. The record catch of about 12,000 tons was made in 1952.

At the World Scientific Meeting on the Biology of Tunas and Related Species, La Jolla, Calif., July 2–14, 1962, a Norwegian scientist reported the results of his investigation of tuna migration. His study showed that bluefin tuna tagged off Spain and the United States migrate to Norwegian waters. (News of Norway, September 6, 1962.)



will match the 1961 catch of 6,500 tons with an export value of 15 million N. krone (US\$2.1 million). (Editor's Note: Off the coast of Norway, tuna are more difficult to catch in the fall because the fish on which they feed become less plentiful and the tuna inhabit the deeper waters.) Most of the Norwegian tuna catch is shipped to Italy, but substantial quantities are also exported to West Germany and Czechoslovakia.



Peru

GOVERNMENT'S NEW PROCEDURES FOR FISH MEAL PLANT LICENSES:

A new Peruvian law (Decree No. 14195) published in El Peruano, August 29, 1962, establishes new procedures for

Peru (Contd.):

issuance of licenses to fish meal plants in Peru. Significant provisions of the new Decree are:

1. An applicant for a license to establish a new fish-meal plant must pay 500 soles (US\$18.65) a ton per hour of raw material capacity.



Fig. 1 - A Peruvian boat with the hold and decks loaded with anchovetas, used for making fish meal and oil. Boat is unloading at the Port of Chimbote.

2. The applicant must obtain authorization from the Office of the Director of Industries and Electricity showing that the plant meets the requirements established for that type of industrial plant.

3. Licenses to set up new plants will be valid for a year and can be renewed for up to one year by making a flat payment of 10,000 soles (\$373) for each month of the renewal.

4. Before entering into regular production, the plant must pass a technical inspection.



Fig. 2 - A typical Peruvian anchoveta boat about ready for launching.

5. A register of fish-meal factories will be set up, to include plants already established as well as those to be established under the new law.

6. Registration, bringing with it a definitive license, can be accomplished by payment of 500 soles a ton per hour of raw material capacity. (Existing plants also must be registered and pay this fee.)

7. Those plants having definitive licenses will pay an annual fee of 200 soles (\$7.46) per ton of capacity.

8. Money from the fees established in the Decree will be used to carry out the programs of the Fish Service in the Republic, principally the program for utilization of fish products in low-cost food for human consumption.

9. Installation of new fish-meal plants is prohibited in certain zones, including Callao, Chimbote, and Laguna Grande.

10. The Ministry of Agriculture is authorized to establish closed fishing seasons as a conservation measure.

The Peruvian Government has already granted about 40 licenses for new fish-meal plants in recent months. In the past, it usually took several months to obtain a license even under the best of conditions. Under the new system, licenses are expected to be issued within about a week after application. This would obviously make it easy to break into the fish-meal business in Peru if one had sufficient capital. The average cost of installing and starting a fish-meal plant in Peru was recently estimated at about \$1 million.

It seems likely that number of new plants, applications for which were pending under the old regulations, will now be granted licenses and begin operations within the next few months. Peruvian Government officials anticipate, however, that most of the 60 to 65 applications now pending will be dropped, since many of those applications were filed by persons who thought they could get licenses and then sell them at a profit. This resulted from licenses being hard to obtain under the old system. It is believed that individuals who still plan to establish plants will find it difficult, or impossible, to get into production in time to benefit from the good fishing season anticipated in late 1962 and early 1963.

A Peruvian industry source, who thinks there are already too many fish-meal plants in Peru, does not believe many new plants will be established as a result of the new Decree. It was also pointed out that the Government apparently intends to take further steps to regulate the industry, and may very well prohibit fishing at certain times, and in certain areas. Concerning this last point, a Government official stated that the Government has no intention of regulating the commercial side of the industry, but will impose conservation measures if such are necessary. Up to now, the Government official said, there is no indication that the anchoveta supply is being overfished.

Peru's fish-meal production has been increasing steadily and is expected to be more than one million metric tons in 1962. In the first 6 months of 1962, Peru's fish-meal production was reported to be 544,000 metric tons according to preliminary data from the International Association of Fish Meal Manufacturers. Most of the leading countries producing fish meal submit monthly data to the Association. Despite the heavy production, the demand and price of Peruvian fish meal have been holding up. Peru's fish-meal production may continue to increase in 1963, but it is too early at this time to predict or guess what effect it will then have on market conditions and prices. (United States Embassy, Lima, Peru, August 31, 1962.)

**Portugal****JOINT JAPANESE-PORUGUESE TUNA VENTURE PROPOSED:**

A large Portuguese firm was reported in August 1962 to have offered a large Japanese fishing company a proposal to establish a joint tuna venture. Under this plan, a tuna base equipped with cold-storage facilities and a packing plant would be established

Portugal (Contd.):

jointly in a Portuguese territory bordering the Atlantic Ocean with Japanese and Portuguese capital, the products to be sold to the European market.

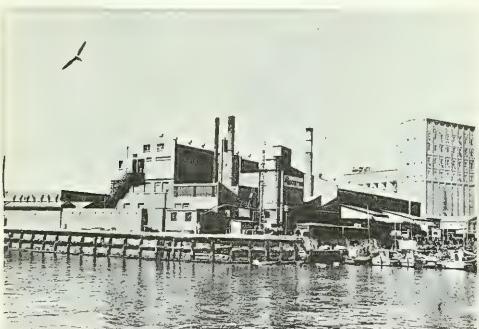
The Japanese firm is said to be studying the offer carefully in view of the tuna import restrictions imposed by the European Common Market. (Shin Suisan Shimbun Sokuhō, August 22, 1962.)



South Africa Republic

PILCHARD-MAASBANKER FISHERY, JANUARY-JUNE 1962:

The South Africa Republic cape west coast pelagic shoal fish catch for the first six months of 1962 totaled 400,394 short tons of pilchards, 63,263 tons of maasbunker, and 19,321 tons of mackerel; a total of 482,978 tons. The catch to the end of June last year was 386,996 tons of pilchards, 41,350 tons of maasbunker, and 45,726 tons of mackerel; a total of 474,072 tons. The total catch in the same period of 1960 was 336,869 tons.



A modern fish meal plant at Alfred Basin Cape Town's first harbor of the last century. The basin is now used mainly by South Africa's deep-sea trawling fleet.

According to figures released by the Division of Sea Fisheries, the June catch was 13,615 tons of pilchards, 10,585 tons of maasbunker, and 34 tons of mackerel; a total of 24,507 tons. This compares with 43,181 tons of pilchards, 11,439 tons of maasbunker, and 10 tons of mackerel in June last year; and with 50,141 tons of pilchards, 1,707 tons of maasbunker, and 80 tons of mackerel in June 1960.

The June 1962 catch yielded 6,376 short tons of fish meal, 457,273 gallons of fish body oil, 1,798,432 pounds of canned pilchards, and 2,564,016 pounds of canned maasbunker.

During June, the shoal fishing industry at Walvis Bay in South-West Africa landed 75,387 short tons of pilchards, and the catch there to the end of June totaled 267,794 short tons. (The South African Shipping News and Fishing Industry Review, August 1962.)



South-West Africa

LARGE ORDER OF CANNED FISH SOLD TO PHILIPPINES:

The South-West African fishing industry has received an order for 900,000 cases of canned fish from the Philippines. The order is valued at about R3 million (US\$4.2 million) and will be shipped in September, October, and November of this year. The Philippine Government's buying organization (NAMARCO) is the purchaser.

Sales of canned fish to the Philippines had been in jeopardy for many months because of the Philippines' foreign exchange problems. Consequently, the South-West African fishing industry was greatly relieved at the consumption of this very large order. (United States Embassy, Pretoria, September 6, 1962.)



Spain

BILBAO FISHERIES TRENDS, SECOND QUARTER 1962:

A total catch of about 3,500 tons of tuna was reported by the 16 Spanish vessels from northern Spain that fished off Dakar and Abidjan, West Africa, in the winter tuna season of 1962. It was Spain's most profitable and successful winter tuna season in the past six years, although catches declined to about one-third of the fleet's capacity in April. The Spanish fleet returned to its home ports at the end of April. It is believed that about 30 Spanish vessels plan to fish for tuna off Africa in the fall of 1962.

The 1962 summer tuna season in those waters began in early June. Initial catches and prospects were good. The early catches

Spain (Contd.):

brought about 60 pesetas a kilogram (\$1,000 a metric ton) in the local retail market for fresh consumption as compared to 45 pesetas a kilogram (\$750 a metric ton) last year.

Anchovies off Spain had been abundant and of good quality and size long before the traditional start of the season on March 1. But anchovy catches during the second quarter of 1962 did not live up to expectations. They were sporadic due to weather conditions and often consisted of small fish. The fish caught was sold mostly for fresh consumption since the prices were too high for the canneries. The total second quarter anchovy catch in the Bilbao district was reported to have been 30 percent less than in the same period of 1961. The average wholesale price in the fishing ports was estimated to have been about 5 pesetas a kilogram (about 3.8 U. S. cents a pound), or twice the price of last year. In view of the light anchovy catches, the Fishermen's Brotherhood increased temporarily the maximum catches per vessel per day from 8,000 kilograms to 10,000 kilograms. (United States Consulate, Bilbao, August 8, 1962.)

* * * * *

TUNA PACKERS SWITCH TO CANNING IN OIL:

The Spanish tuna packing plants seem to have switched to tuna in olive oil from tuna in brine as of August 1962. In European markets tuna canned in olive oil packed in Spain has begun to appear in a noticeable quantity. (Suisan Tsushin, August 23, 1962.)

**Tunisia**YUGOSLAV-BUILT FISHING VESSELS DELIVERED TO TUNISIA:

Five Yugoslav-built seiners were delivered on August 22, 1962, to the Tunisian National Office of Fisheries. Completely equipped, including electronic gear and refrigeration equipment, each of the 60-ton vessels cost about US\$70,000. These vessels are the first to be delivered under an agreement signed in March 1962. (United States Embassy, Tunis, August 24, 1962.)

**U.S.S.R.**SOVIETS BUILD FIRST TUNA LONG-LINE VESSEL:

The hull of the first Soviet tuna long-line vessel was laid in a Far East shipyard in the spring of 1962. The vessel, designed by Leningrad engineers, will have a displacement of 1,000 tons and be capable of fishing for 50 days without touching at port. The vessel's two storage holds with a combined capacity of 100 tons will be refrigerated by a dry method. The vessel will be equipped with a long-line 46.6 miles long with 1,750 hooks; the latest navigation instruments; and fish-finding equipment. The long-line will be set and raised by two winches and tuna processing work will be mechanized. The crew will be quartered in one- and two-berth air-conditioned cabins. (Leningradskaya Pravda, June 29, 1962.)

* * * * *

SOVIETS DESIGN COMBINATION FACTORYSHIP-RESEARCH VESSEL:

Lenigrad engineers have drawn plans for a vessel that will be a floating laboratory as well as a modern commercial stern trawler-factoryship. The vessel will be equipped with 11 research laboratories, submerged port holes for underwater observations, a hydostat that can be lowered to a depth of 600 meters to collect oceanographic data, and 2 aquariums with continuous running water for holding fish under study. But it will also be equipped for stern trawling and purse-seining. A fish meal and oil reduction plant and fish freezing facilities will be installed. It will have a carrying capacity of 300 tons of frozen fish, as well as space for canned fish, cod-liver oil, and "fish flour." The fishing operations of the vessel are expected to pay half of the maintenance costs as well as help determine the best fishing methods.

The Soviets plan to use the vessel in the study of marine life in the near-bottom layers of the sea, marine microfauna and microflora, fish nutrient resources, and other studies. The vessel's laboratories are designed for hydrological, ichthyological, hydro-mechanical, microbiological, and other research.

The vessel will be named after N. M. Knipovich, a zoologist who founded the Soviet school of ichthyologists and organized a num-

U. S. S. R. (Contd.):

ber of Soviet fishing research expeditions. (Leningradskaya Pravda, June 29, 1962.)

* * * * *

SOVIET-BLOC FISHING ACTIVITIES
IN NORTH ATLANTIC:

The Soviet Union continues to utilize the fishery resources of Georges Bank as evidenced by the presence, during August 1962, of a Soviet fleet consisting of 125 to 160 ves-



A 1,500-ton stern trawler-factoryship operating on the Grand Banks.

sels. In addition, several trawlers from East Germany and Poland were also on Georges Bank fishing for herring. (Unpublished sources.)

* * * * *

EXPLORATORY FISHING OFF
SOUTH ATLANTIC COAST:

A Soviet exploratory fishing vessel was reported off the east coast of Florida during August 1962. The vessel, the Boguchar, is a 150-foot refrigerated medium trawler of the Okean class. Earlier in the year (June 1962) the same vessel was reported seeking menhaden off the coast of South Carolina. (Unpublished sources.)

* * * * *

FISHING ACTIVITIES IN GULF OF ALASKA:

Soviet fleets in the Gulf of Alaska during August 1962 continued to fish for Pacific ocean perch. In early August, a mothership and several trawlers were reported taking king crab southwest of Kodiak Island. (Unpublished sources.)



SHARK SWALLOWS DRIFT BOTTLE

Apparently mackerel sharks couldn't care less what they eat. A member of that species of the sharp snout and the razor-like teeth swallowed a drift bottle around Georges Bank about 150 miles off the western tip of Nova Scotia.

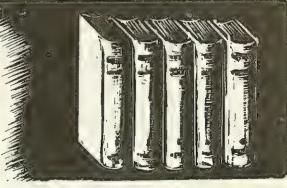
The drift bottle encountered the shark--or vice versa--about a month after it had been cast overboard from the car ferry Bluenose somewhere between Yarmouth and Bar Harbor, Maine. The bottles are released by the Fisheries Research Board of Canada through its biological station at St. Andrews, N.B., for the purpose of getting information on currents. The bottle in question was one of many thrown into the sea in connection with a study of herring movements now being conducted by the Board's biologists.

Inside the bottles are written instructions asking the finder to return information to the Board concerning the time and place where the bottles are found. A reward of one dollar is paid to the person forwarding the information.

A United States fisherman from Quincy, Mass., returned the information about the bottle found inside the shark. The big fish was caught at the northeast peak of Georges Bank in the North Atlantic. (Canadian Department of Fisheries Trade News, April 1962.)



FEDERAL ACTIONS



Civil Service Commission

FISHERY AND WILDLIFE BIOLOGISTS EXAMINATION ANNOUNCED:

The U. S. Civil Service Commission reannounced on August 21, 1962, the "Fishery Biologist and Wildlife Biologist" examination (Announcement 285 B). There is no closing date for the examination.

Fishery and Wildlife Biologists perform professional and scientific work in connection with the conservation and management of fish and other aquatic organisms, such as crustaceans and mollusks, and of various forms of wildlife.

Announcement No. 285 B gives the educational, experience, and training requirements, as well as a more detailed description of the work and duties involved. Copies can be obtained from U. S. Civil Service Regional Offices, or from the U. S. Civil Service Commission, Washington 25, D. C.

Applications for the examination are to be sent to the Executive Secretary, Board of U. S. Civil Service Examiners, Fish and Wildlife Service, U. S. Department of the Interior, Washington 25, D. C. Applications will be accepted until further notice.



Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

OBJECTIONS TO STANDARD OF IDENTITY FOR CANNED TUNA DISALLOWED:

Objections to the requirement that (1) the words "in water" be included in the name on the label of canned water-pack or in-brine tuna and (2) tuna darker than Munsell value 5.3 be labeled "dark tuna" rather than simply "tuna" were disallowed by the Food and Drug Administration in a final order on the

standard of identity for canned tuna published in the Federal Register of September 7, 1962. The order affirmed the proposed findings of fact published in the Federal Register of March 31, 1961. The labeling requirements of the standard of identity for canned tuna become effective 120 days from September 7, 1962, the date the final order was published in the Federal Register.

A notice of a proposal to establish a definition and standard of identity and a standard of fill of container for canned tuna was first published in the Federal Register of August 28, 1956. No objections were filed to the fill of container standard and compositional requirements of the identity standard and the effective date of those provisions was set out in the order of February 13, 1957 (22 F.R. 892). In recognition of the objections to the labeling requirements of the identity standard, those requirements were stayed pending a decision on the objections indicated above.

The final order as it appeared in the September 7, 1962, Federal Register follows:

Title 21—FOOD AND DRUGS

Chapter I—Food and Drug Administration, Department of Health, Education, and Welfare

SUBCHAPTER B—FOOD AND FOOD PRODUCTS

[Docket No. FDC-64]

PART 37—FISH; DEFINITIONS AND STANDARDS OF IDENTITY; STANDARDS OF FILL OF CONTAINER

Findings of Fact and Order Ruling on Objections to Standard of Identity for Canned Tuna

In the matter of establishing a definition and standard of identity for canned tuna fish:

In the Federal Register of August 28, 1956 (21 F.R. 6492), there was published a notice of a proposal to establish a definition and standard of identity and a standard of fill of container for canned tuna fish. An order was published February 13, 1957 (22 F.R. 892), adopting the proposals, with modifications. Subsequently, objections were filed, and a public hearing was requested on two of

the labeling requirements in the identity standard: (1) The requirement that tuna darker than a prescribed level be labeled "dark"; and (2) the requirement that for water-pack tuna the name on the label should include the words "in water". By an order published in the *FEDERAL REGISTER* of August 29, 1957 (22 F.R. 6961), notice was given that no objections had been filed to the fill of container standard or to the compositional requirements of the identity standard, and the effective date for these provisions, as set out in the order of February 13, 1957 (22 F.R. 892), was confirmed. In recognition of the objections to the labeling requirements of the identity standard, these requirements were stayed pending the outcome of the hearing on the issues raised by the objections (23 F.R. 245).

Pursuant to a notice of hearing published in the *FEDERAL REGISTER* (22 F.R. 10964), a public hearing was held to receive evidence on the issues raised by the objectors. Thereafter a tentative order including proposed findings of fact was published March 31, 1961 (26 F.R. 2723). Exceptions to this tentative order were filed in behalf of distributors of water-pack tuna imported from Japan. These exceptions challenged the conclusion that the objectors had failed to prove that the interests of consumers would be promoted by rescinding the provision requiring that the words "in water" be included in the name on labels of water-pack tuna. The record has been restudied, in the light of the exceptions, and findings concerning the objectors' claim that consumers usually discard the oil from oil-pack tuna have been revised. However, these revisions do not alter the ultimate conclusion that consumer interests would not be served by rescinding the requirement for including the words "in water" in the name on labels of water-pack canned tuna.

On the basis of the evidence received at the hearing, and pursuant to the authority vested in the Secretary of Health, Education, and Welfare by the provisions of the Federal Food, Drug, and Cosmetic Act (secs. 401, 701(e)(3), 55 Stat. 1046, 1055 as amended 70 Stat. 919; 21 U.S.C. 341, 371(e)(3)) and delegated to the Commissioner of Food and Drugs by the Secretary (25 F.R. 8625), and after consideration of the exceptions filed, which are adopted in part and rejected in part as is apparent from the detailed findings herein made; *It is ordered:*

A. That the findings of fact in the above-identified matter be established as follows:

*Findings of fact.*¹ 1. By an order published in the *FEDERAL REGISTER* of February 13, 1957 (22 F.R. 892), a definition and standard of identity for canned tuna fish was promulgated. Objections were filed protesting those portions of the order requiring that tuna darker in color than Munsell value 5.3 be declared on the label as "dark tuna" and that the name on the label of canned tuna packed in water rather than in oil include the words "in water" as a part of the name of the food. Notices of the objections, the stay of the labeling requirements, and the announcement of the public hearing on the objections were

¹The citations following each finding of fact refer to the pages of the transcript of testimony and the exhibits received in evidence at the hearing.

published in the *FEDERAL REGISTER* on August 29, 1957 (22 F.R. 6961), and December 28, 1957 (22 F.R. 10964). (Ex. 2, 4, 5, 7, 23)

2. The only issue concerning the color of canned tuna to be determined on the basis of the evidence was raised in the objection filed by one packer, the operator of a cannery in Maine, who advocated changing the wording of § 37.1(d) (3) of the standard from:

(3) *Dark.* This color designation includes all tuna darker than Munsell value 5.3 to

(3) *Tuna.* This designation includes all tuna darker than Munsell value 5.3 canned from the light meat of tuna.

The objection did not make an issue of whether the method specified in the order was appropriate for making the differentiation between dark and light tuna; or whether the value for such differentiation was properly set at 5.3 on the Munsell scale; or of whether the standard should require the label designation for tuna darker than Munsell value 5.3 to be different from the label designation for tuna lighter than Munsell value 5.3. The sole issue was whether the standard should require cans containing tuna darker than Munsell value 5.3 to be labeled "dark tuna" rather than simply "tuna." (R. 9, 11-12, 14, 17, 38, 47, 54-55; Ex. 7)

3. The only witness who supported the objection to the label declaration "dark tuna" sometimes employed the phrase "light meat of tuna" to mean striated muscular tissue, as specified in § 37.1(c) of the standard, without regard to the color shade of such tissue. At other times, when referring to this same striated muscular tissue (as prepared from large blue-fin tuna and from Atlantic little tunny), the witness used the term "dark meat." Apparently it was for this dark-colored striated muscular tissue that he urged the change of the standard to provide for labeling it by the unmodified word "tuna" though he sometimes used the designation "dark meat" or "black meat" to mean non-striated tissue, which is an entirely different part of the fish and which the standard requires to be eliminated before canning. (R. 18, 33-34, 37, 43, 50, 66)

4. Several kinds of tuna have been caught in the Atlantic waters, but the only color determinations reported in the record are for the categories little tunny; large blue-fin tuna, exceeding 500 pounds in weight; and blue-fin tuna ranging in weight from 20 pounds to 104 pounds. These color determinations showed that little tunny and the large blue-fin tuna yield canned tuna of color darker than Munsell 5.3. The canned tuna prepared from the smaller blue-fin tuna (those not exceeding 104 pounds in weight) measured lighter than Munsell 5.3. (R. 10, 18, 29-30, 54, 58, 60, 74, 76; Ex. 8)

5. The canned article prepared from large blue-fin tuna, where the fish weighed in excess of 500 pounds each, not only was of a dark color but it was coarse in texture and had a distinctive taste, described as stronger, heartier, and more fishy. The opinion was expressed that this darker colored, stronger flavored article prepared from large blue-fin tuna would appeal to a limited segment of consumers. (R. 14, 33-35, 46-47, 58-59)

6. The responses to a questionnaire answered by more than 4,000 consumers

showed an interest on the part of a substantial number of consumers in having labels show whether the meat in the can is light or dark. A consumer survey in which interviewers visited 252 households in which the homemaker used canned tuna showed that 65 percent of these homemakers regarded a color photograph of a can of tuna measuring 5.3 on the Munsell scale as dark tuna. Over two-thirds of the homemakers interviewed were interested in whether the tuna they serve is light or dark tuna, and substantially all wanted the label on the cans to show whether the tuna is light or dark. (R. 140-141, 162-164, 168, 172, 184-189, 202-204, 210-212, 273, 278-279, 281-282; Ex. 14, 17, 24, 25, 26)

7. In households where canned tuna is used, one of the forms in which it is most frequently served is as a salad. For use as a salad the color of tuna is important to housewives and they wish to avoid dark tuna for salads. (R. 42, 168-169)

8. The other issue for the hearing arose from objections filed by distributors of water-pack tuna imported from Japan. These distributors objected to the requirement that the name on the label of such canned tuna should include the words "in water." They asserted: (a) That showing the words "in water" in the name would lead consumers to believe that water would be a major ingredient of the food and that cans so labeled would contain less fish than equal-sized cans of oil-pack tuna; (b) that consumers usually discard the oil from oil-pack canned tuna; (c) that by inference the provision concerning label declaration of the words "in water" requires that these words must follow the word "tuna" in the same line on labels. They declared that these assertions would be proved by consumer letters and consumer-survey data that would be produced at the hearing. (R. 86-87, 91, 98, 101, 106-107, 109, 111-114, 134-135; Ex. 23)

9. Historically, it has been conventional to use vegetable oil as the packing medium for canned tuna. Tuna canned in the United States, with the exception of tuna prepared for special dietary usage, has been packed in oil. Around 1951 or 1952 small quantities of imported canned tuna packed in water appeared on the United States markets. Since then, the volume of imported water-pack tuna has increased considerably but remains substantially below the total volume of oil-pack tuna on the market. (R. 108, 112, 121, 127, 145-146, 148-149, 173, 249-250; Ex. 15, 16)

10. By various expressions the objectors asserted that consumers usually discard the oil from oil-pack tuna. Two objectors stated that the oil is "in practically all instances discarded"; one that it is "usually discarded"; another that it is "common practice to discard the oil"; and two objectors asserted that it is safe to state that 98 percent of consumers dispose of the oil "since it is not considered an edible part of the contents." The objectors failed to prove their assertions. The results of a questionnaire-type survey submitted by the Food and Drug Administration showed that of more than 4,000 consumers who answered the questionnaire, 56.4 percent reported that when using oil-pack tuna they either always or sometimes use the oil. This percentage agrees well with data published by the Fish and Wildlife Service of the United States Department

of the Interior, showing that of more than 1,900 homemakers interviewed in a 1956 survey, 38.7 percent reported that in using oil-pack tuna they always use the oil with the fish and 20.4 percent reported that they sometimes use the oil. (R. 109, 150, 278-279; Ex. 16, 24-26)

11. Consumers are concerned whether the canned tuna they purchase is the conventional oil-pack article or is tuna packed in water. Some labels on water-pack tuna have shown "no oil added" or "without added oil," but, in general, the declaration that the tuna is packed in water has been so subordinated on labels that consumers would be apt to overlook it under customary conditions of purchase. Housewives serve canned tuna in various ways; they make salads, sandwiches, casserole dishes, tuna-with-noodles, and use tuna in other cooked dishes. Generally, recipes for the cooked dishes, and frequently those for tuna in salads, call for using the oil from the can along with the tuna fish. The oil adds richness and significantly increases the caloric value of the dishes. When following such recipes, a housewife using water-pack tuna needs to add butter, margarine, or salad oil. It promotes her interest in the label declaration showing that the tuna is packed in water to be so displayed that under ordinary conditions of purchase she will note it.

Some distributors of imported water-pack tuna have sought in their promotions to appeal to those consumers who wish to avoid high-calorie foods. These promotions have emphasized that canned tuna where water has been substituted for oil as the packing medium is lower in caloric value than conventional oil-pack tuna. The interest of these consumers also is promoted by a prominent label declaration to show that the tuna is packed in water. (R. 120, 128, 134, 137, 138, 167-174; Ex. 12).

12. A consumer survey especially designed to elicit evidence from a fair sample of homemakers on the issues raised

Note: See Commercial Fisheries Review, May 1961 p. 68,
July 1961 p. 98.

in the objections to the canned tuna order was carried out by an organization experienced in conducting such consumer interviews. In this survey homemakers were shown cans of water-pack tuna under conditions designed to simulate those she would experience in marketing for canned foods. For cans with commercial labels, fairly representative of the labels that have been used on water-pack tuna and showing "Packed in water" on side panels, two-thirds of the homemakers interviewed mistakenly thought that the tuna was packed in oil. (R. 79-83, 178-190, 200-202, 207-210, 219, 221-223, 237, 245, 255, 270-271; Ex. 17-22)

13. The evidence at the hearing did not support the assertion by the objectors that including the words "in water" in the name on labels of water-pack tuna would lead consumers to believe water to be a major ingredient and to believe that the cans so labeled would contain less fish than similar cans of oil-pack tuna. In the consumer survey described in Finding 12, the interviewers showed homemakers cans of water-pack tuna with labels specially printed to conform to the requirements of the standard. The names on the labels were:

LIGHT TUNA FLAKES
IN WATER

and

SOLID PACK
LIGHT TUNA IN WATER

The homemakers were asked whether they thought the cans of water-pack tuna would contain less fish, the same amount of fish, or more fish than cans of the same size where the tuna is packed in oil. Half the homemakers answered that the amount of fish would be the same and the others divided about equally between answering that there would be less fish or more fish in the cans of water-pack tuna. Two witnesses trained in statistically evaluating such data testified that these results do not

support the claim that showing the words "in water" in the names on labels would lead consumers to believe the cans contain less tuna fish. (R. 87, 106-107, 111-112, 136, 204, 213-214, 251, 267-269, 274-275; Ex. 17-22)

14. The objectors to the labeling requirement for water-pack tuna failed to show that it would promote consumer interests to rescind the provision that the words "in water" be included in the name and to substitute a requirement that water be named on labels as an optional ingredient. One witness, supporting the objections, expressed approval of a suggestion that the words "in water" be shown on labels in type half as large, and on a line below, the other words in the name. A witness, trained and employed in the field of home economics, objected to the use of smaller type for the words "in water." She explained that women are accustomed to getting tuna packed in oil and for that reason when the tuna is packed in water the label should declare "in water" in easily legible type. She made no specific objection to the suggestion that these words be shown in a line immediately below other words in the name. (R. 97, 152, 156, 160, 165-168, 170, 173)

B. That the objections to the standard of identity be disallowed.

Effective date. Provisions A and B of this order are effective 120 days from the date of publication in the **FEDERAL REGISTER**.

C. That the stay as to the effective date of the labeling requirements of § 37.1(h) of the standard of identity for canned tuna (23 F.R. 245) shall terminate 120 days following the date of publication of this order in the **FEDERAL REGISTER**.

(Secs. 401, 701(e)(8), 52 Stat. 1046, 1056 as amended 70 Stat. 919; 21 U.S.C. 341, 371(e)(3))

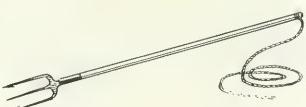
Dated: August 31, 1962.

GEO. P. LARRICK,
Commissioner of Food and Drugs.



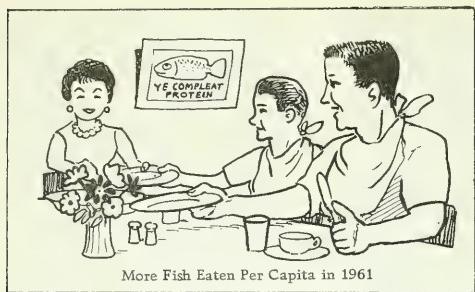
SPEAR

The spear is a fishing implement provided with two or more pointed barbed or barbless prongs or blades. The blades are usually not detachable from the handle or shaft. The instrument is generally thrown by hand. A rope is sometimes fastened to the shaft to aid in retrieving the spear.



Spear.

Note: Excerpt from Circular 109, Commercial Fishing Gear of the United States, for sale by the Superintendent of Documents, Government Printing Office, Washington 25, D. C., single copy, 40 cents.



More Fish Eaten Per Capita in 1961

Department of the Interior

COMMERCIAL FISHERIES BUREAU EMPLOYEE APPOINTED ASSISTANT TO INTERIOR'S SCIENCE ADVISER:



Howard H. Eckles.

Howard H. Eckles, of McLean, Va., has been appointed assistant to the Interior Department's science adviser, Secretary of the Interior Stewart L. Udall announced on September 14, 1962. Eckles, a career employee, has been serving as chief of the Branch of Marine Fisheries in the Fish and Wildlife Service's Bureau of Commercial Fisheries since 1958. He joined the

Department in 1948 as a research biologist and has served since then in progressively higher positions.

Secretary Udall said, "We have established this position under the Department's Science Adviser, Dr. Roger Revelle, for the purpose of broadening the career experience of the younger, talented scientists of the Department." Eckles is the first to be appointed and will return to the Bureau of Commercial Fisheries upon completion of his assignment.

FISH AND WILDLIFE SERVICE

PROPOSED REGULATIONS FOR ENFORCEMENT OF DESIST ORDERS AGAINST POSSIBLE RESTRAINT OF TRADE BY FISHERY COOPERATIVES:

The Department of the Interior published in the Federal Register of August 31, 1962,

proposed rules of procedure governing the enforcement of the issuance of cease and desist orders against associations of producers of aquatic products that the Secretary of the Interior has reason to believe are monopolizing or restraining trade in interstate or foreign commerce to such an extent that the price of any aquatic product is unduly enhanced. The proposed regulations give the scope of the rules, and have provisions for institution of proceeding, complaint, notice of hearing, intervention, hearing, and preparation and issuance of final decision and order.

Interested persons had until September 29, 1962, to submit comments, suggestions, or objections on the proposed regulations.

The Act of June 25, 1934 (48 Stat. 1213; 15 U.S.C. 521-522), the functions under which were transferred to the Secretary of the Interior by 1939 Reorganization Plan No. II, in section 2 thereof provides a remedy whereby the associations of producers of aquatic products authorized by section 1 of the Act may be ordered by the Secretary of the Interior to cease and desist from monopolizing or restraining trade in interstate or foreign commerce to such an extent that the price of any aquatic product is unduly enhanced by reason thereof. The proposed rules implement section 2 of the Act by establishing the procedure to be followed by the Secretary of the Interior or his authorized representative, in the enforcement of the section.

* * * *

BUREAU OF COMMERCIAL FISHERIES

SHELLFISH EXPERT TRANSFERRED TO PACIFIC COAST:

Dr. Victor L. Loosanoff, an internationally-recognized authority in shellfish biology, was appointed by the U. S. Fish and Wildlife Service's Bureau of Commercial Fisheries to the position of Research Fishery Biologist on the Pacific Coast, effective October 1, 1962, the Department of the Interior announced. He will be stationed in Tiburon, Calif. Loosanoff has been director of the Bureau of Commercial Fisheries Biological Laboratory at Milford, Conn., since it was established in November 1931.

During his career, devoted almost entirely to research on the biology of oysters, clams, and other marine invertebrates and their enemies, he has made major scientific breakthroughs--notably in the development of methods for the farming of mollusks and their ar-

tificial propagation under hatchery conditions, and in his oyster pests control studies resulting in the development of a "fence" of chemically-treated sand which effectively prevents the invasion of oyster beds by oyster drills, one of the oysters' deadliest predators. Work is continuing on both of these achievements to enable their potential economic benefits to be made available to the industry.

In recognition of the importance of utilizing to the maximum extent the talents and experience of our Nation's most outstanding scientists, Loosanoff's promotion will relieve him of administrative duties and permit him to continue his valuable shellfish research. In addition to the already impressive list of published reports on his work, completion of the study, analysis, and publication of other accumulated data from his 30 years of shellfish investigations, which will be accomplished in his new position, will be of inestimable value to the science of shellfish biology throughout the world.

Loosanoff's location on the West Coast will also make him available, as requested, for consultation and advisory services to the shellfish authorities of the Pacific States, and to educational institutions and their graduate students in aquatic biology.



Eighty-Seventh Congress

(Second Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Intro-



duction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

AMERICAN SAMOA INCLUDED IN CERTAIN LAWS: The House on Aug. 23, 1962, received the conference report (H. Rep. No. 2264) on H.R. 10062, to extend the application of certain laws to American Samoa. Would authorize the Secretary of the Interior to request Fed-

eral departments, corporations, or agencies to extend, without reimbursement, scientific and technical assistance to promote the welfare of the territory. Examples of the sorts of technical assistance which may be called for from time to time include revision of Samoa's tax structure, education, agricultural and fisheries production and marketing, harbor improvement, public utilities, and land planning and zoning. There is a limitation of an aggregate of \$250,000 in any one fiscal year.

House Report No. 2264, Extending the Application of Certain Laws to American Samoa (Aug. 23, 1962, Report from the Committee of Conference, United States House of Representatives, 87th Congress, 2nd Session, to accompany H.R. 10062), 3 pp., printed. The Committee of Conference agreed to recommend to their respective Houses that the House recede from its disagreement to the amendments of the Senate and agree to the same with an amendment.

The Senate on Aug. 28, 1962, adopted the conference report (H. Rep. No. 2264) on H.R. 10062, to extend the application of certain laws to American Samoa.

The House conferees and the Senate conferees agreed that authority to request technical assistance from other departments shall rest with the Secretary of the Interior, instead of the Governor of Samoa. It was also agreed that benefits from the School Lunch Act and the other acts included in the bill shall not become effective except upon request of the Secretary of the Interior made to the Secretary of Agriculture and to the Secretary of Health, Education, and Welfare.

The House on Aug. 30, 1962, adopted the conference report (H. Rep. 2264) on H.R. 10062.

The House and the Senate on Sept. 4, 1962, approved H. Con. Res. 519, that the President of the United States is requested to return to the House of Representatives the enrolled bill H.R. 10062, to extend the application of certain laws to American Samoa, for re-enrollment in conformance with the conference report (H. Rep. No. 2264) thereon adopted by the two Houses.

The President of the United States on Sept. 25, 1962, signed H.R. 10062, to extend the application of certain laws to American Samoa (P.L. 87-688).

ATOMIC ENERGY AGENCY: The Fifth Annual Report Covering U.S. Participation in the International Atomic Energy Agency for 1961 (Message from the President of the United States Transmitting the Fifth Annual Report Covering U.S. Participation in the International Atomic Energy Agency for the Year 1961, Pursuant to the International Atomic Energy Agency Participation Act), H. Doc. 538, 40 pp., printed. Contains the Annual Report on the activities of the International Atomic Energy Agency (IAEA) and on the participation of the United States therein, presented to Congress by the President; letters of transmittal; operational activities (consist of preliminary assistance missions, training courses and fellowships and exchange of scientists, experts and equipment, information and conferences, research etc.; relations with other organizations; and administrative and budgetary matters. A report on the fifth regular session of the General Conference of IAEA is also included. In research, studies are under way on soils, fertilizers and plant growth, entomological problems, animal diseases, and food preservation. Agreement was reached during 1961 on a 3-year joint research program with the Oceanographic Institute in Monaco. Under the a-

greement work began on the study of radionuclides and their concentrates in organisms in the sea and the effects of such concentrates on the organisms. In its program relating to radioactive waste disposal, the Agency convened panels that dealt with (1) problems of disposal of wastes into fresh water, (2) preparation of a manual on safe disposal of small-scale users, (3) methods of monitoring disposal into the sea and standardizing sampling and analysis of radionuclides in sea water and in marine products, and (4) methods of treating and storing radioactive wastes rather than discharging them into the environment. The publications issued the previous year by the IAEA also are listed.

EXEMPT TRANSPORTATION OF AGRICULTURAL AND FISHERY PRODUCTS: The Senate Committee on Commerce on Aug. 24, 1962, continued hearings on S. 3243, to exempt certain carriers from minimum rate regulation in the transportation of bulk commodities, agricultural and fishery products, and passengers, and for other purposes. Testimony was heard from various agencies and industry personnel. Hearings were recessed subject to call.

The Senate Committee on Commerce resumed hearings Sept. 10-12, and again on Sept. 24-26, 1962, on S. 3243.

FISHERY RESOURCES INTERNATIONAL CONFERENCE: S. Res. 392 (Magnuson et al) introduced in the Senate on Sept. 14, 1962, to express sense of the Senate on International Conference on the Conservation of Fishery Resources; referred to the Committee on Commerce. Upon introducing this legislation, Senator Magnuson stated that the "fisheries are an important economic and employment factor in 22 of our 50 states which front the oceans, and to a degree in the 8 others which border the Great Lakes which we share with Canada. Our fisheries are international, and the problems which confront our fisheries and those of other nations of the world are international." One of the problems is maintaining the species which man has found most desirable as food, and also the species for which important industrial uses have been found. For several species, the peril point already has been reached; for others it is approaching. With the great population increases expected over the years, the demands for protein foods will be inevitable from whatever source they may be obtained and one of the principal sources is the sea and shore.

The nations of the world must not only begin to think about conservation, but must do something about it; and that requires understanding, mutual agreements, and accommodations."

The Senate on Sept. 20, 1962, received a favorable report (S. Rept. 2112) from the Committee on Commerce on S. Res. 392.

The Senate on Sept. 20, 1962, considered and agreed to S. Res. 392: Resolved, That it is the sense of the Senate that the President should propose an International Conference on the Conservation of Fishery Resources to consider the technical, economic, and scientific problems relating to the conservation, utilization, and regulation of living marine resources in the high seas and estuarine waters of the world, and that government, industrial, scientific, and technical participation in such Conference on as wide a basis as may be practicable should be encouraged." Since this is a Senate resolution no House action is required.

FOOD AND AGRICULTURE ACT OF 1962: The House on Sept. 17, 1962, received the report (H. Rept. 2385) from the Committee of Conference on H.R. 12391, to improve and protect farm income, to reduce costs of farm programs to the Federal Government's excessive stocks of agricultural commodities, to maintain reasonable and stable prices of agricultural commodities and products to consumers, to provide adequate supplies of agricultural commodities for domestic and foreign needs, to conserve natural resources, and for other purposes. Included is an amendment which defines "farmers" to include persons who are engaged or intend to engage in fish farming, and the term "farming" to include fish farming.

The House on Sept. 20, 1962, adopted the conference report (H. Rept. 2385) on H.R. 12391.

The Senate on Sept. 25, 1962, adopted the conference report (H. Rept. 2385) on H.R. 12391; thus clearing the bill for the President's signature.

The President on Sept. 27, 1962, signed H.R. 12391 (P.L. 87-703).

INDEPENDENT OFFICES APPROPRIATIONS: The House Committee on Appropriations July 27, 1962, reported out of Committee (H. Rept. 2050) appropriations for independent offices. On July 30, 1962, H.R. 12711 was introduced in the House, making appropriations for sundry independent executive bureaus, boards, commissions, corporations, agencies, and offices for the fiscal year ending June 30, 1963, and for other purposes. Passed the House on Aug. 1, 1962. Received in the Senate on Aug. 2, 1962, referred to the Committee on Appropriations. Reported to the Senate from the Committee on Appropriations (S. Rept. 1923) on Aug. 27, 1962. Passed the Senate, amended on Aug. 31, 1962. The Senate insisted on its amendments and asked for a conference with the House. The House on Sept. 13, 1962, agreed to a conference. The conference report was filed Sept. 14, 1962 (H. Rept. 2376).

H. Rept. 2376, Independent Offices Appropriation Bill, 1963 (Sept. 14, 1962), a report from the Committee of Conference, House of Representatives, 87th Congress, 2nd Session, to accompany H.R. 12711, 20 pp., printed. The Committee of Conference came to agreement and presented their recommendations to the respective Houses. Included are funds for the Office of Science and Technology. The Committee appropriates \$750,000 for salaries and expenses instead of \$700,000 as proposed by the House and \$850,000 as proposed by the Senate. The Congress has laid down programs concerning the National Aeronautics and Space Administration, the National Science Foundation, the Atomic Energy Commission, and other agencies. The conferees ask the Director of the Office of Science and Technology that any changes in those scientific programs be submitted for the approval and action of the Congress.

The House on Sept. 18, 1962, concurred with the conference report (H. Rept. 2379) on a number of Senate amendments, but insisted on its disagreement on three Senate amendments. The Senate on Sept. 19, 1962, agreed to the conference report and insisted on its amendments and asked for a further conference.

The House and the Senate, Sept. 25, 1962, received from the Committee of Conference the further conference report (H. Rept. 2466) on the amendments still in dispute on H.R. 12711.

H. Rept. 2466, Independent Offices Appropriations Bill, 1963 (Sept. 25, 1962), a report from the Committee of Conference, House of Representatives, 87th Congress, 2nd Session, to accompany H.R. 12711, 3 pp., printed. The Committee of Conference having reached an agreement on the amendments in dispute on the bill recommended passage to their respective Houses. Contains a statement on the Managers on the part of the House.

The Senate and the House on Sept. 25, 1962, adopted the conference report (H. Rept. 2466) on H.R. 12711, making appropriations for sundry independent executive bureaus, boards, commissions, corporations, agencies, and offices for the fiscal year ending June 30, 1963, and for other purposes. Included are funds for the Office of Science and Technology. The Congress has laid down programs concerning the National Aeronautics and Space Administration, the National Science Foundation, the Atomic Energy Commission, and other agencies. The conferees ask the Director of the Office of Science and Technology that any changes in those programs be submitted for the approval and action of the Congress.

INCOME TAX REVISIONS IN FAVOR OF FISHERMEN: The Senate on Sept. 10, 1962, passed H.R. 6413, to extend to fishermen the same treatment accorded farmers in relation to estimated income tax, with a amendment after adopting committee amendment relating to time for filing declaration of and payment of estimated income tax, and rejecting committee amendment that would have added section respecting limitation on deductions for charitable contributions. Makes it possible for commercial fishermen to file their income tax estimates at the end of the tax year and pay the amount by the following January 15, rather than filing the estimates by April 15 of the same tax year and paying the estimates quarterly during the year. Alternatively, commercial fishermen would have the option of filing returns and paying the taxes on or before February 15 following the close of the tax year.

The House on Sept. 11, 1962, agreed to the Senate amendments to H.R. 6413, therefore clearing the bill for the signature of the President.

The President of the United States, on Sept. 25, 1962, signed H.R. 6413 (P.L. 87-682).

MAINE LOBSTERMAN STATUE: H. Res. 799 (Tupper) introduced in the House on Sept. 12, 1962, making provisions for a statue to "The Maine Lobsterman" in new Southwest Washington, D.C.; referred to the Committee on House Administration.

The House on Sept. 14, 1962, gave unanimous consent that H. Res. 799 be rerefereed from the Committee on House Administration to the Committee on the District of Columbia. Subcommittee No. 5 of the Committee on the District of Columbia met Sept. 17, 1962, on the resolution.

The House Committee on the District of Columbia met in executive session Sept. 19, 1962, and ordered reported favorably H.J. Res. 799.

The House on Sept. 20, 1962, received the report (H. Rept. 2446) from the Committee on the District of Columbia on H. Res. 799. Referred to the Committee of the Whole House on the State of the Union.

The House, Sept. 24, 1962, passed H. Res. 799. Resolution asks the National Capital Planning Commission

of the District of Columbia to provide for a suitable site for the "Maine Lobsterman Statue," which is to be supplied and erected by the State of Maine. No Senate action required on a House resolution.

NATIONAL FISHERIES CENTER AND AQUARIUM: The Senate, Sept. 21, 1962, passed with amendment H.R. 8181, authorizing construction of a National Fisheries Center and Aquarium in the District of Columbia. Adopted were all committee amendments en bloc, thereafter considered as original text of bill; Miller amendment to provide that such fees shall be charged as will cover costs of construction and of operation of the Center; Miller amendment to limit use of educational and scientific facilities of the Center to those whose nations make such facilities available to United States citizens and with whom the U. S. has diplomatic relations; and a Randolph amendment of a technical corrective nature. A motion by Sen. Morse to recommit the bill to the Committee on Public Works was rejected.

The House on Sept. 24, 1962, received from the Senate H.R. 8181 (amended). Congressman McMillan requested the bill be taken from the Speaker's desk so that the House could concur in the Senate amendments. Congressman Gross objected, therefore, no action was taken on the bill.

NETTING IMPORTS FOR RESEARCH: The Senate on Sept. 12, 1962, insisted on its amendment (adding the text of S. 1814, providing for free importation of monofilament gill nets for use in fish sampling) to H.R. 12180, to provide a temporary suspension of duty on personal and household effects brought into the United States under Government orders, agreed to the conference asked by the House, and appointed conferees.

The House on September 18, 1962, received the conference report (H. Rept. 2413) on H.R. 12180. The Conference retained the amendment which adds the text of S. 1814.

H. Rept. 2413, Household Effects--Monofilament Gill Fish Nets--Accident and Health Insurance Contract Premiums: (Sept. 18, 1962), a report of the Committee of Conference, House of Representatives, 87th Congress, 2nd Session, to accompany H.R. 12180, 4 pp., printed. The Committee of Conference having reached agreement recommended to their respective Houses passage of the bill. Contains statement of the managers on the part of the House and the amendments.

The House on Sept. 21, 1962, adopted the conference report (H. Rept. 2413) on H.R. 12180.

OCEANOGRAPHIC RESEARCH PROGRAM: The Senate on August 29, 1962, received from the House S. 901 amended (passed in lieu of H.R. 12601), to advance the marine sciences, to establish a comprehensive 10-year program of oceanographic research and surveys, to promote commerce and navigation, to secure the national defense, to expand ocean, coastal, and Great Lakes resources, to authorize the construction of research and survey ships and laboratory facilities, to expedite oceanographic instrumentation, to assure systematic studies of effects of radioactive materials in marine environments, to enhance the public health and general welfare, and for other purposes. The Senate disagreed to the amendments of the House and requested a conference. The following conferees were

appointed for the Senate: Senators Smathers, Engle, Bartlett, Butler, and Keating.

The House on Sept. 14, 1962, insisted on its amendments to S. 901, and asked for a conference. The following conferees were appointed: Dingell, Lennon, MacDonald, Casey, Pelly, Ellsworth, and Morse.

The Committee of Conference, in executive session, Sept. 24, 1962, agreed to file a conference report on the differences between the Senate- and House-passed versions of S. 901.

The House Sept. 27, 1962, received the report (H. Rept. 2493) from the Committee of Conference on S. 901. It is to be cited as the "Oceanographic Act of 1962."

PACIFIC MARINE FISHERIES COMPACT: The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries met Aug. 28, 1962, on H.R. 12205, to consent to the amendment of the Pacific Marine Fisheries Compact and to the participation of certain additional States in such compact in accordance with the terms of such amendment. Alaska, Hawaii, and Idaho will be eligible for membership.

The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries met in executive session Sept. 18, 1962, and ordered reported favorably to the full committee S. 3431.

The House Committee on Merchant Marine and Fisheries met in executive session Sept. 20, 1962, and ordered reported favorably S. 3431.

The House on Sept. 21, 1962, received the report (H. Rept. 2454) on S. 3431: Referred to the Committee of the Whole House on the State of the Union.

POTOMAC RIVER COMPACT (MD. & VA.) OF 1958: The Senate, Sept. 25, 1962, received a report (S. Rept. 2156) from the Committee on the Judiciary without amendment on H. J. Res. 693, granting consent of the Congress to a compact entered into between the State of Maryland and the Commonwealth of Virginia for the creation of the Potomac River Compact of 1958. Gives Maryland and Virginia permission to set up a Potomac River Fisheries Commission. It would regulate through three members from each State the taking of fish and shellfish from the Potomac River between the District of Columbia line and Chesapeake Bay. Research, regulation of fisheries, an oyster inspection fee and licensing would be within the power of the new commission. The compact succeeds an obsolete agreement of 1785, which has been disputed by the States.

The Senate Sept. 27, 1962, passed H.J. Res. 693.

PRICE-QUALITY STABILIZATION: Quality and Price Stabilization (Hearing before a Subcommittee of the Committee on Interstate and Foreign Commerce, House of Representatives, 87th Congress, 2nd Session, on H.J. Res. 636, H.J. Res. 637, H.J. Res. 639, H.J. Res. 679, H.R. 10335, H.R. 10340, H.R. 10517, H.R. 1127, H.R. 11346, and H.R. 11778, joint resolutions and bills to amend the Federal Trade Commission Act to promote quality and price stabilization, to define and restrain certain unfair methods of distribution, to confirm, define, and equalize the rights of pro-

ducers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes, June 11, 12, 13, 14, 15, 1962), 466 pp., printed. Contains reports of various Federal agencies; statements of various members of Congress and industry people, and statements and communications received from members of industry.

The House Committee on Interstate and Foreign Commerce in executive session, Aug. 30, 1962, ordered favorably reported H.J. Res. 636 (amended), to amend the Federal Trade Commission Act, to promote quality and price stabilization, to define and restrain certain unfair methods of distribution and to confirm, define, and equalize the rights of producers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes.

The House on September 12, 1962, received the report (H. Rept. No. 2352) from the Committee on Interstate and Foreign Commerce on H. J. Res. 636.

H. Rept. 2352, **Quality Stabilization Act** (Sept. 12, 1962, Report of the Committee on Interstate and Foreign Commerce, House of Representatives, 87th Congress, 2nd Session, to accompany H.J. Res. 636), 73 pp., printed. Committee reported joint resolution favorably, with amendments, and recommended passage. Contains explanation of the joint resolution, background information, need for legislation, reports from executive departments and agencies, changes in existing law, and economic consequences.

SALMON DEVELOPMENT PROGRAM IN CALIFORNIA: The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries met Sept. 11, 1962, on H.R. 11343 and identical bills, to direct the Secretary of the Interior to initiate a salmon and steelhead development program in California. Would authorize an anadromous fish development in California. This is based on joint recommendations of the U. S. Fish and Wildlife Service and the California Department of Fish and Game. Existing facilities of the Bureau of Sport Fisheries and Wildlife and the California Department of Fish and Game would be utilized to the fullest extent.

The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries on Sept. 12, 1962, concluded hearings on H.R. 11343 and related bills.

On Sept. 18, 1962, the Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries met in executive session and ordered reported favorably to the full committee, amended, H.R. 11343.

SALMON IMPORT RESTRICTIONS: The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries met Sept. 11, 1962, on H.R. 9547, to facilitate the application and operation of the Fish and Wildlife Act of 1956, and for other purposes. Would prohibit the import of salmon products derived from fish caught by nationals of any country that permits fishing for salmon on by gill nets on the high seas at times and places where occur large quantities of immature salmon of North American origin.

The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine

and Fisheries on Sept. 12, 1962, concluded hearings on H.R. 9547. Testimony was heard from Department of the Interior witnesses.

The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries met in executive session on Sept. 18, 1962, and ordered reported favorably to the full committee, amended, H.R. 9547.

The House Committee on Merchant Marine and Fisheries met in executive session, Sept. 27, 1962, and ordered favorably reported as amended H.R. 9547.

SPORT FISH RESEARCH: The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries met Aug. 28, 1962, on H.R. 7826, to authorize and direct the Secretary of the Interior to conduct studies of the genetics of sport fishes and to carry out selective breeding of such fishes to develop strains with inherent attributes valuable in programs of research, fish hatchery production, and management of recreational fishery resources.

TECHNOLOGICAL LABORATORY LAND IN MARYLAND: The Senate Committee on Interior and Insular Affairs in executive session, Sept. 5, 1962, ordered favorably reported S. 3019 (amended), to provide for the conveyance of certain real property of the United States to the State of Maryland. Property affected is the site of the Bureau of Commercial Fisheries Technological Laboratory at College Park, Maryland.

The Senate on Sept. 7, 1962, received from the Committee on Interior and Insular Affairs the report (S. Rept. No. 2020) on S. 3019 with amendments.

Senate Report No. 2020, Providing for the Conveyance of Certain Real Property of the United States to the State of Maryland (Sept. 7, 1962, Report from the Committee on Interior and Insular Affairs, United States Senate, 87th Congress, 2nd Session, to accompany S. 3019), 4 pp., printed. The Committee reported favorably on the bill with amendments and recommended passage. Contains purpose, need, costs, and Departmental reports.

The Senate on Sept. 12, 1962, passed with amendment S. 3019.

TEXAS RESOURCES AND PROBLEMS: The Report of the U.S. Study Commission - Texas (H. Doc. 494, House of Representatives, 87th Congress, 2nd Session), printed, Part I, The Commission Plan, 209 pp., illus.; Part II, Resources and Problems, 380 pp., illus.; Part III, The Eight Basins, 228 pp., illus.; and Part IV, Summary and Recommendations, 20 pp., illus. This report is the product of a cooperative river basin planning effort conducted under the study commission form of organization. It is a final report (in compliance with Public Law 85-843), in three volumes, on a basic, comprehensive, and integrated plan of development of the land and water resources of the Neches, Trinity, Brazos, Colorado, Guadalupe, San Antonio, Nueces, and San Jacinto River Basins in the State of Texas. In Part I, Chapter 8 (Analysis of Water Problems) devotes a section to fish and wildlife, water pollution control and abatement, and the effect of water resource development on resources of marine bays. Part II, has a chapter on fish, wildlife, and recreation which covers fishery resources, fresh-water fish, and marine fish. Also included in Part II are short sec-

tions on propagation of fish and other aquatic life, shellfish culture, and problems in estuaries.

TRADE EXPANSION ACT OF 1962: H. Res. 795 (Boggs) introduced in the House on Sept. 6, 1962, to authorize the printing of a document entitled "Free Trade, Tariff Legislation, and Common Markets for the Western Hemisphere" as a House document and to provide for the printing of additional copies; to the Committee on House Administration.

Senate Finance Committee reported favorably on H.R. 11970, to promote the general welfare, foreign policy, and security of the United States through international trade agreements and through adjustment assistance to domestic industry, agriculture, and labor. Committee approved these additional amendments: Permit President to increase duties or impose other import restrictions; trade adjustment allowances to be paid from Federal funds; permit President to impose import duties or other restrictions on products of countries with restrictions against U.S. agricultural products; on escape clause, redrafted to provide that injury need only result "in major part" of concessions granted and Tariff Commission also to consider inability of a firm to make a reasonable profit; Tariff Commission not required to make industrywide investigation if firm files a petition of adjustment assistance; permit President to negotiate with Great Britain and "Outer Seven" as well as Common Market to reduce tariffs to zero; give President authority to enter into orderly marketing agreements with foreign countries limiting the export of certain articles to the U.S. Another amendment would give the President discretionary authority to withdraw United States concessions from any one country which discriminates against another with resulting injury to the United States. Effort to continue "peril point" defeated; Tariff Commission would make studies of effect of proposed cuts, but would not have to designate a specific "peril point."

The Senate on Sept. 17, 1962, received the report (S. Rept. 2059) from the Committee on Finance on H.R. 11970.

S. Rept. 2059, Trade Expansion Act of 1962 (Sept. 14, 1962, Report from the Committee on Finance, U.S. Senate, 87th Congress, 2nd Session, to accompany H.R. 11970), 40 pp., printed. The Committee reported the bill favorably with amendments and recommended passage of the bill. Contains the purposes of the bill which are: (1) to extend the authority of the President to enter into foreign trade agreements for 5 years from July 1, 1962, through June 30, 1967; (2) to authorize the President to proclaim modifications in or the continuance of existing duties or other import restrictions or such additional import restrictions as he determines to be required or appropriate to carry out such trade agreements; and (3) to authorize adjustment assistance to industries, firms, and groups of workers who may be seriously injured or threatened with serious injury by increased imports resulting from concessions granted in trade agreements. It also contains committee amendments; principal features of the bill as reported; technical explanation of provisions amended; changes in existing law; and comments of Senator Carl T. Curtis.

The Senate on Sept. 18, 1962, worked on H.R. 11970. There were the following actions on amendments:

Adopted: Smathers amendment to language providing that payments of unemployment insurance to adversely-

affected workers shall be disregarded in certain instances where State agency is reimbursed therefor; Pell amendment to allow a special study by Tariff Commission regarding wages paid in foreign supply countries; Bartlett amendment regarding conservation of fishery resources; Bush amendment providing that Tariff Commission shall consider level reasonable profit in tariff adjustments; and Kerr amendment respecting filing with Tariff Commission of petitions for tariff adjustments.

The fishery amendment (Bartlett) states that at a conference on the conservation of international fishery resources the President shall seek to persuade countries whose domestic fishing practices or policies affect such resources, to engage in negotiations on the use or conservation of such resources. Amendment would permit President to increase the tariff rate on fishery products to a rate not more than 50 percent above the rate in effect on July 1, 1934, from any country which fails to engage in negotiations in good faith concerning conservation of fishery resources. This amendment was substituted for the original Bartlett amendment (withdrawn) which provided for the use of import quotas or embargoes for fishery products under certain conditions.

Rejected: By 38 yeas to 40 nays, Bush amendment to restrict the President's tariff-cutting powers by restoring to the bill the peril point provisions of existing law (Mansfield motion to table Dirksen motion to reconsider the vote rejecting this amendment was adopted by 40 yeas to 39 nays); by 13 yeas to 65 nays (motion to reconsider tabled). Curtis amendment to authorize the establishment of a legislative branch committee which, upon disapproval of any raising, lowering, or imposition of new tariff, may recommend congressional action for final decision thereon; by 23 yeas to 58 nays (motion to reconsider tabled). Curtis amendment to eliminate provision for financial assistance to firms and workers adversely affected by the legislation. Various other amendments were rejected also.

The Senate on Sept. 19, 1962, passed with amendments H.R. 11970. A technical corrective amendment by Senator Mansfield was adopted before the bill was passed. Senate insisted on its amendments, asked for a conference with the House, and appointed the following conferees: Byrd (Va.), Kerr, Long (La.), Smathers, Williams (Del.), Carlson, and Curtis.

The House on Sept. 20, 1962, disagreed to Senate amendment to H.R. 11970. Agreed to a conference requested by the Senate. The following conferees were appointed: Mills, King (Calif.), Boggs, Keogh, Mason, Byrnes (Wisc.), and Baker.

The Committee on Conference, in executive session, Sept. 26, 1962, agreed to file a conference report on the differences between the Senate- and House-passed versions of H.R. 11970.

The House Committee on House Administration, Sept. 26, 1962, met in executive session and ordered reported favorably H. Res. 795, to authorize the printing of a document entitled "Free Trade, Tariff Legislation, and Common Markets for the Western Hemisphere."

TRANSPORTATION ACT OF 1962: The Senate Committee on Commerce on Aug. 24, 1962, continued hearings on S. 3242, to provide for the strengthening and improving the national transportation system, and for other purposes.

The Senate Committee on Commerce resumed hearings Sept. 10-12, and again on Sept. 24-26, 1962, on S. 3242.

TUNA CONVENTION ACT OF 1950, AMENDMENTS: The Subcommittee on Inter-American Affairs of the House Committee on Foreign Affairs met Aug. 28, 1962, on S. 2568, to amend the act of Sept. 7, 1950, to extend the regulatory authority of the Federal and State agencies concerned under the terms of the Convention for the establishment of an Inter-American Tropical Tuna Commission, signed at Washington, May 31, 1949, and for other purposes. The Inter-American Tropical Tuna Commission was originally conceived as an investigatory body. But with recent development of new fishing techniques and gear, namely purse seining with nylon nets and power blocks, the productivity of the U. S. tuna fleet has increased rapidly, particularly as regards yellowfin tuna, and certain conservation regulations are needed. Would provide for the issuance and enforcement of Federal regulations to carry out recommendations of the Commission for the conservation of tuna (especially yellowfin) resources in the eastern Pacific.

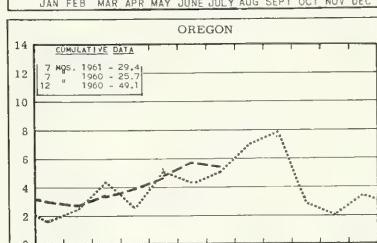
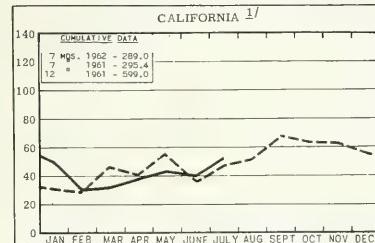
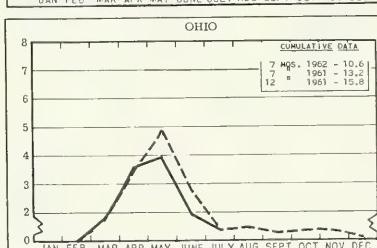
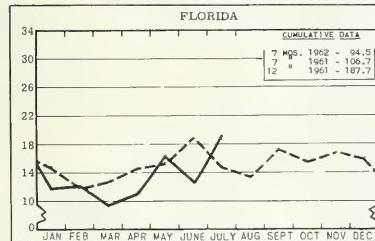
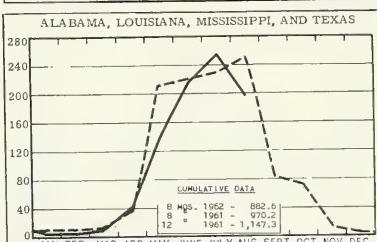
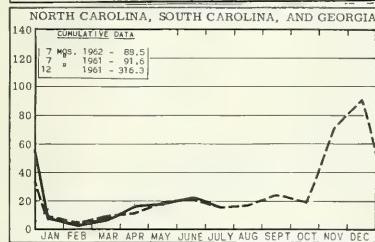
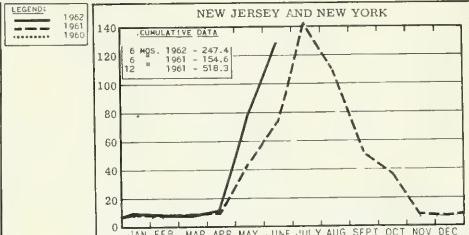
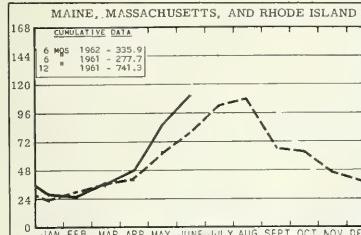
The House on Sept. 18, 1962, received the report from the Committee on Foreign Affairs (H. Rept. 2409) on S. 2568 (amended). Referred to the Committee of the Whole House on the State of the Union.

H. Rept. 2409, Conservation of Tropical Tuna (Sept. 18, 1962, report from the Committee on Foreign Affairs, House of Representatives, 87th Congress, 2nd Session, to accompany S. 2568), 24 pp., printed. The Committee reported the bill favorably with amendments and recommended passage. Contains the purpose and need for the bill; generally it will provide the necessary authority to the Secretary of the Interior to issue regulations for controlling the amount of tuna, tuna-like and tuna-bait fish caught in the area, to provide for the imposition of embargoes on tuna caught in violation of the regulations, and to provide various penalties for acts in violation of the regulations; committee action; detailed discussion of the bill; changes in existing law made by the bill; and appendix.



FISHERY INDICATORS

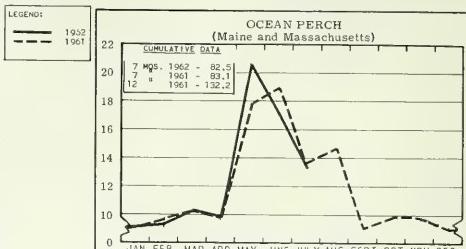
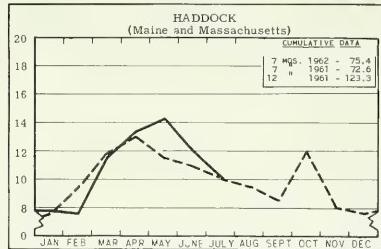
CHART I - FISHERY LANDINGS for SELECTED STATES
In Millions of Pounds



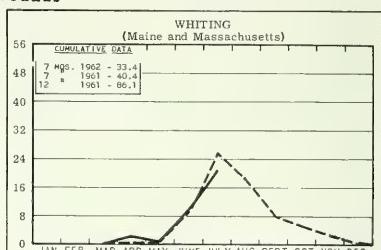
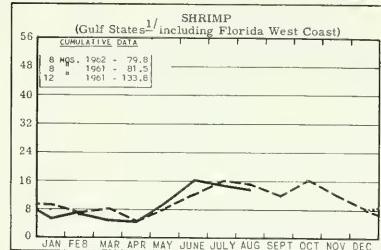
1/ ONLY PARTIAL - INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

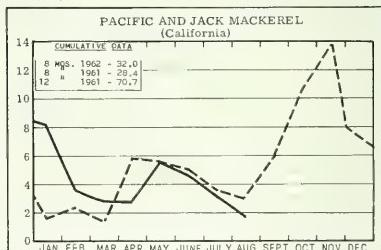
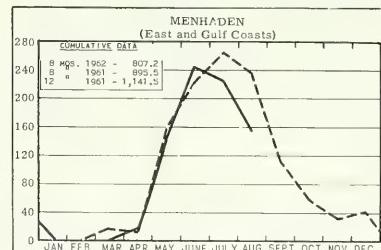


In Millions of Pounds



^{1/}LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COM-
PLTE.

In Thousands of Tons



In Thousands of Tons

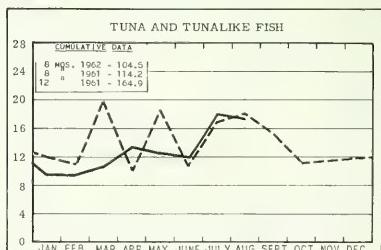
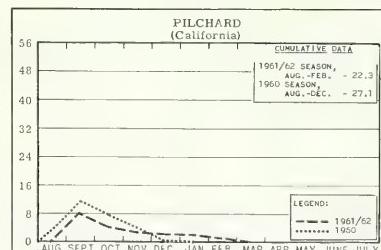
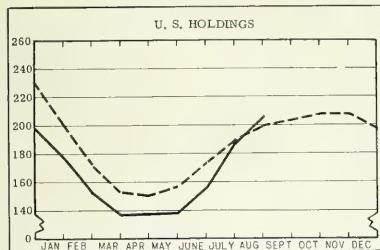
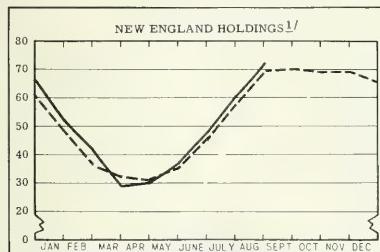
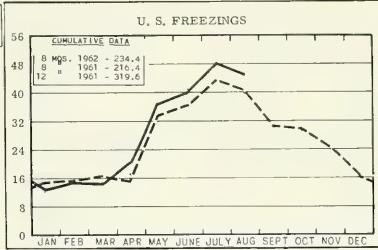


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

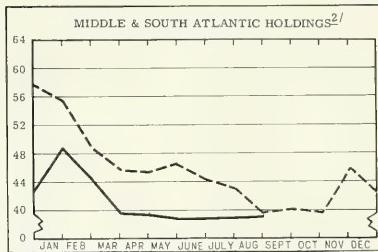
In Millions of Pounds



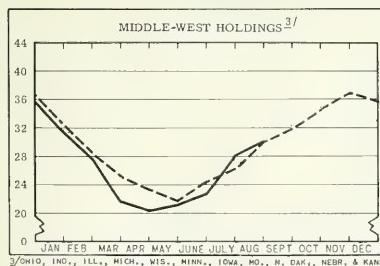
LEGEND:
— 1962
- - - 1961



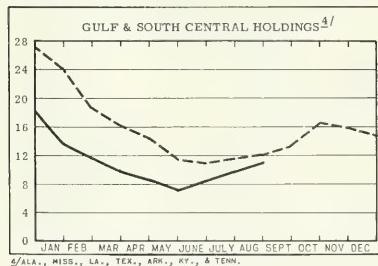
^{1/}MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT.



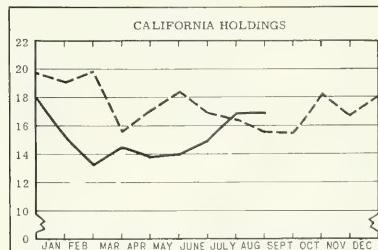
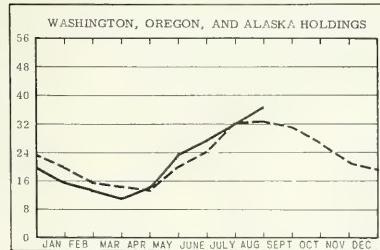
^{2/}ALL EAST COAST STATES FROM N. Y. SOUTH.



^{3/}OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR., & KANS.



^{4/}ALA., MISS., LA., TEX., ARK., KY., & TENN.

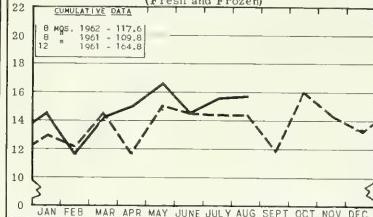


* Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

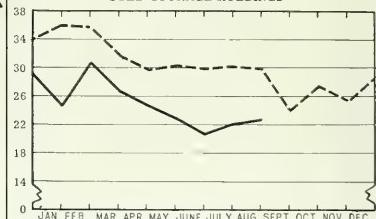
RECEIPTS^{1/} AT WHOLESALE SALT-WATER MARKET
(Fresh and Frozen)



^{1/}INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

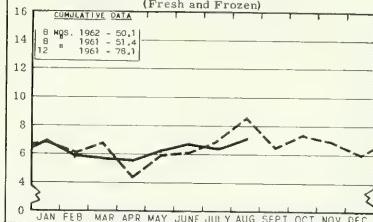
NEW YORK CITY

COLD-STORAGE HOLDINGS^{2/}



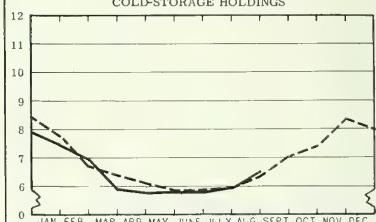
^{2/}AS REPORTED BY PLANTS IN METROPOLITAN AREA.

RECEIPTS AT WHOLESALE MARKET
(Fresh and Frozen)



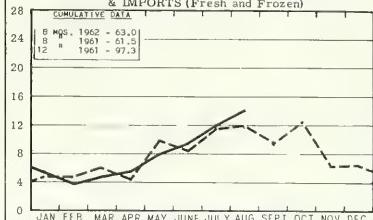
CHICAGO

COLD-STORAGE HOLDINGS



SEATTLE

WHOLESALE MARKET RECEIPTS, LANDINGS,
& IMPORTS (Fresh and Frozen)



LEGEND:

— 1962

- - - 1961

BOSTON

COLD-STORAGE HOLDINGS

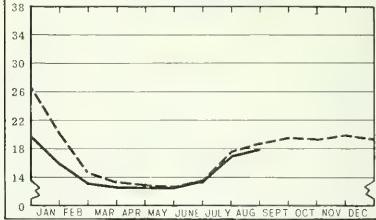
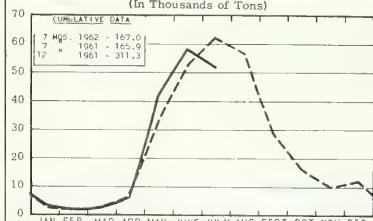


CHART 5 - FISH MEAL and OIL PRODUCTION - U.S and ALASKA

FISH MEAL
(In Thousands of Tons)



FISH OIL
(In Millions of Gallons)

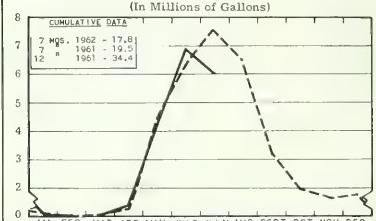
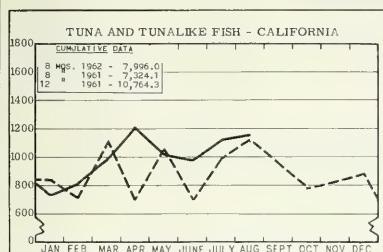
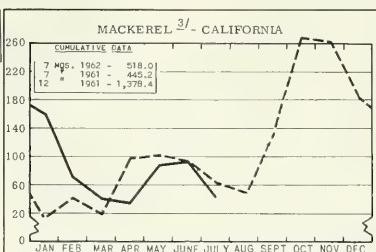


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

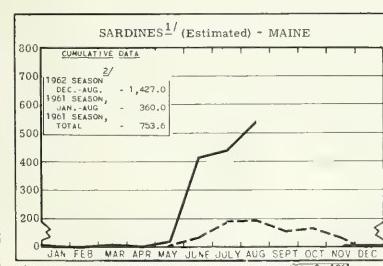
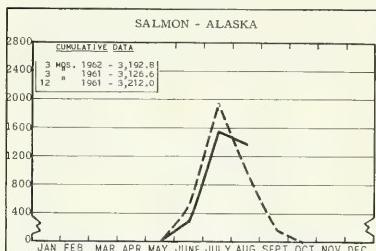
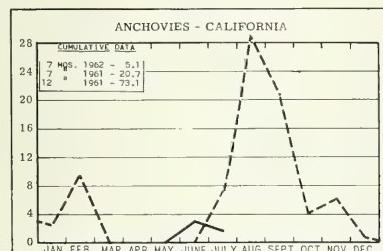
In Thousands of Standard Cases



LEGEND:
— 1962
- - - 1961



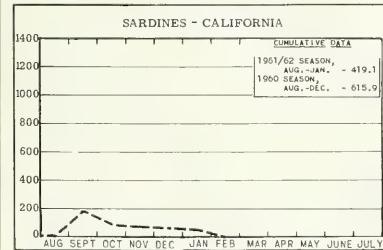
3/ INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	¼ drawn	3½ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# ½ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES..	48	½-lb.	8 oz.

1/ INCLUDING SEA HERRING. 2/ THE 1962 SEASON STARTED DEC. 2, 1961.



LEGEND:
— 1962/63
- - - 1961/62
.... 1960/61

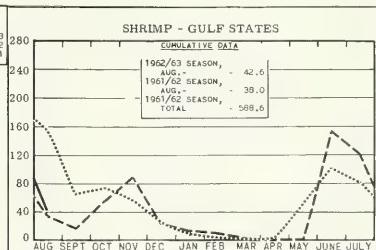
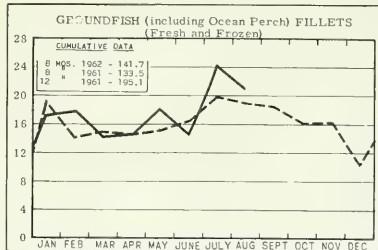
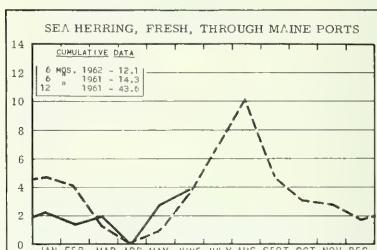
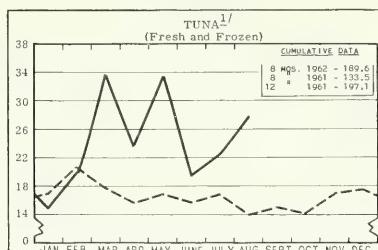
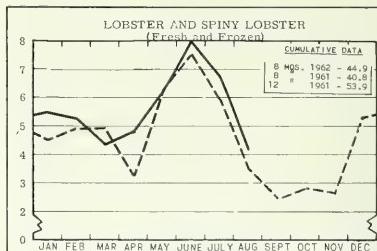
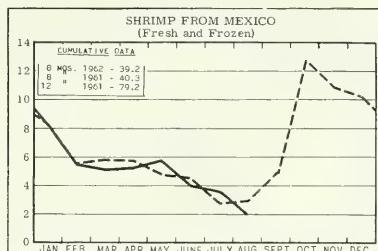
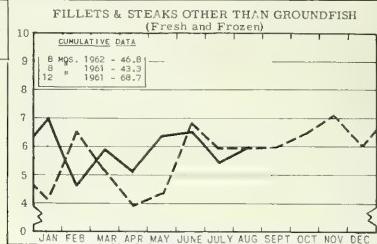


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

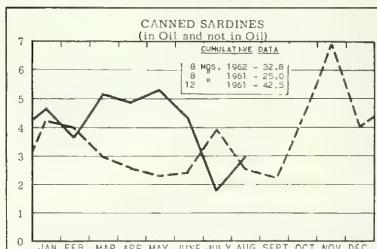
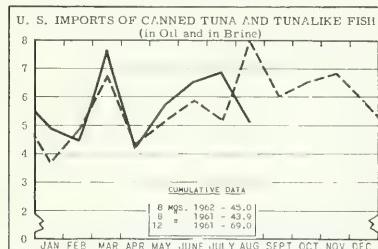
In Millions of Pounds

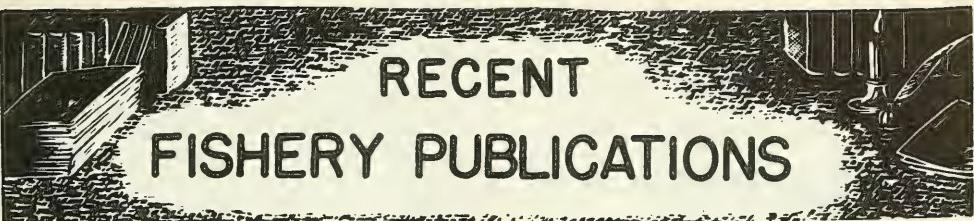


LEGEND:
— 1962
- - - 1961
- · - 1960



^{1/} EXCLUDES LOINS AND DISCS.





FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

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FL - FISHERY LEAFLETS.
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SSR - FISH - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

Number	Title
CFS-2908	Alabama Landings, April 1962, 3 pp.
CFS-2927	Maine Landings, April 1962, 4 pp.
CFS-2929	Wisconsin Landings, April 1962, 2 pp.
CFS-2930	Michigan Landings, March 1962, 3 pp.
CFS-2931	Alabama Landings, May 1962, 3 pp.
CFS-2932	North Carolina Landings, May 1962, 4 pp.
CFS-2934	New Jersey Landings, May 1962, 4 pp.
CFS-2936	Mississippi Landings, April 1962, 3 pp.
CFS-2937	Florida Landings, May 1962, 9 pp.
CFS-2938	Rhode Island Landings, April 1962, 3 pp.
CFS-2939	Wisconsin Landings, May 1962, 2 pp.
CFS-2940	Frozen Fish Report, June 1962, 8 pp.
CFS-2942	Georgia Landings, May 1962, 2 pp.
CFS-2943	Fish Meal and Oil, May 1962, 2 pp.
CFS-2944	Massachusetts Landings, February 1962, 5 pp.
CFS-2945	Michigan Landings, April 1962, 3 pp.
CFS-2946	Ohio Landings, May 1962, 2 pp.
CFS-2947	Maryland Landings, May 1962, 3 pp.
CFS-2948	Texas Landings, April 1962, 3 pp.
CFS-2949	New York Landings, May 1962, 4 pp.
CFS-2950	Virginia Landings, May 1962, 3 pp.
CFS-2951	Fish Sticks and Portions, April-June 1962, 2 pp.
CFS-2952	Maine Landings, May 1962, 4 pp.
CFS-2953	Shrimp Landings, February 1962, 6 pp.
CFS-2956	North Carolina Landings, June 1962, 3 pp.
CFS-2958	South Carolina Landings, June 1962, 2 pp.
CFS-2968	Florida Landings, June 1962, 8 pp.
FL-23 (Revised May 1962)	- Earthworms for Bait, 5 pp.
FL-97 (Revised April 1957)	- Fish Culture as a Livelihood, 4 pp., 1959.
FL-190 (Revised April 1962)	- Turtle Trapping, 9 pp., illus.
FL-359 (Revised June 1961)	- Manufacturers of Equipment for the Fish Processing Industries, 12 pp.

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FL-535 - Jellyfishes and Related Animals, by Victor L. Loosanoff, 9 pp., illus., February 1962.

Sep. No. 655 - The Blue Crab and its Fishery in Chesapeake Bay--Part 2 - Types of Gear for Hard Crab Fishing.

Sep. No. 656 - Equipment Note No. 13--Soviet Trawlers Observed in Gulf of Alaska.

SSR-Fish, No. 390 - Seasonal Occurrence of Marine Fishes in Four Shores Habitats Near Beaufort, N. C., 1957-60, by Marlin E. Tagatz and Donnie L. Dudley, 20 pp., illus., August 1961.

SSR-Fish, No. 400 - Tuna Oceanography in the Eastern Tropical Pacific, by Maurice Blackburn, 51 pp., illus., February 1962.

SSR-Fish No. 403 - Attempts to Guide Small Fish with Underwater Sound, by Clifford J. Burner and Harvey L. Moore, 33 pp., illus., February 1962. A summary of attempts to guide fish by means of subaqueous sonic vibrations. The tests were made during November and December 1947 and March and April 1949 at the Biological Station at Leetown, W. Va. The tests were limited to four undersea warfare sound-producing instruments involving three principles of sound production: electromagnetism, Piezoelectricity, and the hydraulic turbine.

SSR-Fish, No. 404 - An Oceanographic Study of the Gulf of Tehuantepec, by Maurice Blackburn, 31 pp., illus., February 1962.

SSR-Fish, No. 408 - Variability in Pink Salmon Escapements Estimated from Surveys on Foot, by William L. Sheridan, 10 pp., illus., March 1962.

SSR-Fish, No. 411 - Distribution of Fish Eggs and Larvae, Temperature, and Salinity in the Georges Bank-Gulf of Maine Area, 1955, by Robert R. Major, John B. Colton, Jr., and Donald B. Foster, 69 pp., illus., March 1962.

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Outdoor Fish Cookery, Special Fisheries Marketing Bulletin, 24 pp., illus., printed, 1961.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Number	Title
MNL-56	Norwegian Fisheries, 1961
MNL-58	Republic of Korea's Fishing Industry, 1961.
MNL-73	Red Sea Fishery Off Massawa, Ethiopia.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, June 1962, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore 2, Md.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and by provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, June 1962, 16 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; Oregon and Washington receipts (domestic and imports) of fresh and frozen tuna and tunalike fish; for the month indicated.

California Fishery Products and Byproducts Brokers and Importers, 1962 (Partial List, as Revised July 1, 1962), SP List 1, 6 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) Contains the names and addresses of primary receivers of various types of imported fishery products and byproducts in the Los Angeles, San Diego, San Francisco, and Oakland areas.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, June 1962, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the month indicated.

English Translations of Pacific Salmon Literature (A Preliminary List), compiled by Paul T. Macy, 24 pp., processed. Literature Research Unit, U. S. Bureau of Commercial Fisheries, Biological Laboratory, 2725 Montlake Blvd., Seattle 2, Wash., March 20, 1961.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, July 1962, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 103 S. King St., Hampton, Va.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, June 1962 and July 1962, 21 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial-fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith, and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the months indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--April 1962, 18 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; market trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, July 1962, 9 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle 4, Wash.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl receipts reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

The Story of the Bureau of Commercial Fisheries Biological Laboratory, Woods Hole, Massachusetts, by Paul S. Gaitsoff, Circular 145, 124 pp., illus., printed, May 25, 1962. (Bureau of Commercial Fisheries, Biological Laboratory, Woods Hole, Mass.) A historical sketch of the Woods Hole Biological Laboratory, and the part Spencer Fullerton Baird, the first Commissioner of Fisheries, played in the establishment of the first marine biological station in

the United States. It discusses the scientific and marine investigations undertaken in the formative years, and gives a general outline of the research projects carried out in the laboratory and the more important contributions during the years 1887-1951. In addition to its function as a fishery research center for the North Atlantic area, in 1951 the Laboratory became the center of United States research activities sponsored by the International Commission for the Northwest Atlantic Fisheries.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE U. S. FISH AND WILDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, AT THE INDICATED OFFICES:

101 TERMINAL ISLAND, CALIFORNIA.

The Study on the Color of the Fishing Net. I--Observations on the Passage of Fishes Through a Colored Net, by Kenji Kanda and Atushi Koike, Translation Series No. 1, 6 pp., processed. (Translated from the Japanese Bulletin of the Japanese Society of Scientific Fisheries, vol. 23, no. 10, 1958, pp. 612-616, printed.

P. O. BOX 3830, HONOLULU, HAWAII.

The Basic Types of Vertical Distribution of Copepods in the Central Pacific Ocean, by A. K. Heinrich, 6 pp., illus., processed. (Translated from the Russian Doklady Akademii Nauk SSSR, vol. 132, no. 4, 1960, pp. 921-924.)

The Horizontal Distribution of Copepods in the Central Pacific and the Factors Determining It, by A. K. Heinrich, 14 pp., illus., processed. (Translated from the Russian Trudy Instituta Okeanologii, vol. 41, 1960, pp. 31-41.)

The Surface Plankton of the Central Pacific, by A. K. Heinrich, 8 pp., illus., processed. (Translated from the Russian Trudy Instituta Okeanologii, vol. 41, 1960, pp. 42-47.)

FISHERY TECHNOLOGICAL LABORATORY
2725 MONTLAKE BLVD., SEATTLE 2, WASH.

Carbonyl Compounds in Fish as Related to the Deterioration. II--Thermal Production of Formaldehyde in Fish Flesh, by Fuyuo Ota, 8 pp., processed. (Translated from the Japanese Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 5, 1958, pp. 338-341.)

Rusting of Fish Products and Its Prevention, by Junsaku Nonaka, 21 pp., processed. (Translated from the Japanese Yushi Kagaku Kyokaishi, vol. 7, no. 5, 1958, pp. 317-322.)

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Determining Age of Young Haddock from Their Scales, by Albert C. Jensen and John P. Wise, Fishery Bulletin 195 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 61), pp. 439-450, illus., printed, 15 cents, 1962.

Development, Distribution, and Comparison of Rudder Fishes (KYPHOSUS SECTATRIX, Linnaeus, and K. INCISOR, Cuvier) in the Western North Atlantic, by Donald Moore, Fishery Bulletin 196 (from Fishery

Bulletin of the Fish and Wildlife Service, vol. 61), pp. 451-480, illus., printed, 30 cents, 1962.

Estimating Red Salmon Escapements by Sample Counts from Observation Towers, by Clarence Dale Becker, Fishery Bulletin 192 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 61), pp. 355-369, illus., printed, 20 cents, 1962.

Growth of the Adult Male King Crab (PARALITHODES CAMTSCHATICA,Tilesius), by Douglas D. Weber and Takashi Miyahara, Fishery Bulletin 200 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 62), pp. 53-75, illus., printed, 25 cents, 1962.

Influence of Early Maturing Females on Reproductive Potential of Columbia River Blueback Salmon (ON-CORHYNCHUS NERKAY), by Richard L. Major and Donovan R. Craddock, Fishery Bulletin 194 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 61), pp. 429-437, illus., printed, 15 cents, 1962.

Propagation and Distribution of Food Fishes for the Calender Years 1959 and 1960, Statistical Digest 52, 48 pp., printed, 1962, 20 cents.

Raft Culture of Oysters in Massachusetts, by William N. Shaw, Fishery Bulletin 197 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 61), pp. 481-495, illus., printed, 20 cents, 1962. Discusses an experiment to test the possibility of growing oysters attached to rafts as a method of culture that might be useful in reviving the declining oyster industry. Describes the area involved in the experiment as to temperature, salinity, oxygen content, and pH of the water and aquatic life in the river; construction of the raft; origin of oysters used; assembling the strings of oysters; and determining the shell growth and oyster mortality. Includes also an analysis of results of shell growth rate; effects of temperature, fouling, and spawning on growth; and mortality and practical aspects of raft culture. The experiment demonstrates that raft culture is commercially feasible in Massachusetts.

Rearing Tilapia for Tuna Bait, by Thomas S. Hida, Joseph R. Harada, and Joseph E. King, Fishery Bulletin 198 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 62), pp. 1-20, illus., printed, 20 cents, 1962. Discusses the hatchery rearing of *Tilapia mossambica* in 1958 and 1959 at Paia, Maui, to determine if tilapia could be produced economically to supplement the supply of naturally occurring bait fish. A description of the hatchery and its operation and the results obtained are presented. Discusses environmental conditions, chemical determinations, stocking the brooding tanks, feeding schedules, collecting the fry, and production and mortality of the young. Also discusses production of bait-size tilapia, 1958-1959; acclimatization of tilapia to sea water; utilization of tilapia as bait; and production costs.

Studies on PARORCHIS ACANTHUS (Trematoda: Diogenea) as a Biological Control for the Southern Oyster Drill, THAIS HAEMASTOMA, by Nelson R. Cooley, Fishery Bulletin 201 (From Fishery Bulletin of the Fish and Wildlife Service, vol. 62), pp. 77-91, illus., printed, 20 cents, 1962.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ADRIATIC FISH:

Kvantitativno-Kvalitativna Analiza Ribiljih Naselja Kanala Srednjeg Jadrana (Quantitative-Qualitative Analysis of the Fish Populations in the Channels of the Adriatic), by S. Zupanovic, Acta Adriatica, vol. 9, no. 3, 1961, 151 pp., illus., printed in Serbo-Croatian with summary in French, Institut za Oceanografiju i Ribarstvo, Split, FNR, Yugoslavia.

Novi Podaci o Maksimalnim Duzinama Nekih Jadranjskih Riba (New Data on Maximum Length of Certain Adriatic Fish), by Fabjan Grubisic, Biljeske-Notes, no. 14, 1959, 8 pp., printed in Serbo-Croatian with summary in French, Institut za Oceanografiju i Ribarstvo, Split, FNR, Yugoslavia.

Prilog Poznavanju Biologije Jadranjskih Riba CHONDRICHTHYES (Contribution to the Knowledge of the Biology of Adriatic Fish), by S. Zupanovic, Acta Adriatica, vol. 9, no. 4, 1961, 84 pp., illus., printed in Serbo-Croatian with summary in French, Institut za Oceanografiju i Ribarstvo, Split, FNR, Yugoslavia.

Sur La Presence de Genre RUVEOTTUS COCCO en Adriatique (On the Presence of the Species *Ruveottus cocco* in the Adriatic), by Dinko Morovic, Biljeske-Notes, no. 15, 1960, 8 pp., illus., printed in French with summary in Serbo-Croatian, Institut za Oceanografiju i Ribarstvo, Split, FNR, Yugoslavia.

AIRCRAFT IN FISHERIES:

"Planes Provide Yeoman Service," by Bruce Woodland and J. J. Quigley, article, Trade News, vol. 15, no. 1, July 1962, pp. 3-6, illus., printed. Department of Fisheries, Ottawa, Canada.

ALGAE:

Marine Algae From the Tropical Atlantic Ocean. V-Algae From the Lesser Antilles, by William Randolph Taylor, 21 pp., illus., printed. (Reprinted from Contributions from the United States National Herbarium, vol. 36, part 2, pp. 43-62.) U. S. National Museum, Smithsonian Institution, Washington, D.C., 1962.

"Some Fresh-Water Algae of New York," by George J. Schumacher, article, The Conservationist, vol. 16, no. 6, June-July 1962, pp. 22-25, 36, illus., printed. The Conservationist, Room 335, State Campus, Albany, N.Y.

ANCHOVETA:

Artificial Fertilization of the Eggs, and Rearing and Identification of the Larvae of the Anchoveta, CETENGRALIS MYSTICETUS, by Edward F. Klima, Izadore Barrett, and John E. Kinne, Inter-American Tropical Tuna Commission Bulletin, vol. 6, no. 4, 1962, 26 pp., illus., printed in English and Spanish, Inter-American Tropical Tuna Commission, La Jolla, Calif. Discusses results of a study to identify anchoveta, an important bait fish used to

capture tunas in the Eastern Tropical Pacific Ocean, from the time of hatching to about 25 mm. Describes the artificial fertilization of anchoveta eggs; and rearing of planktonic eggs and larvae. Also covers examination of field collections of anchovy larvae made shortly before, during and immediately after the anchoveta spawning season, to identify and separate the anchoveta larvae from the larvae of other anchovies, using meristic, morphometric, and anatomical characteristics.

Fecundity of the Anchoveta (CETENGRALIS MYSTICETUS) in the Gulf of Panama, by Clifford L. Peterson, Inter-American Tropical Tuna Commission Bulletin, vol. 6, no. 2, 1961, 14 pp., illus., printed in English and Spanish. Inter-American Tropical Tuna Commission, La Jolla, Calif.

ANTIBIOTICS:

"Effects of Tetracycline Antibiotics on the Products of Anserinase Action in Chill Stored Haddock (*Gadus aeglefinus*) Muscle," by B. Sanz Perez and N. R. Jones, article, Journal of Food Science, vol. 27, no. 1, January-February 1962, pp. 69-72, illus., printed, Institute of Food Technologists, 510-522 No. Hickory St., Champaign, Ill.

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The Results of Surveys on Young Cod and Haddock in the Barents Sea During the Period 1946-1959, by A. S. Baranenkova, 13 pp., processed. (Translated from the Russian Soviet Fisheries Investigations in North European Seas, 1960, pp. 267-275.) Ministry of Agriculture, Fisheries, and Food, Fisheries Laboratory, Lowestoft, Suffolk, England, 1961.

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Estudios Sobre la Reproducción del "Bonito" SARDA CHILENSIS en Aguas Adyacentes a la Costa Peruana. I--Desarrollo Sexual, Época y Características del Desove (Studies on the Reproduction of "Bonito" Sarda chilensis in Waters Adjacent to the Peruvian Coast. I--Sexual Development and Characteristics of the Spawning Season), by Aurora Chirinos de Vilodoso, Serie de Divulgación Científica No. 14, 77 pp., illus., processed in Spanish. Ministerio de Agricultura, Dirección de Pesquería y Caza, Lima, Peru, 1960.

BRAZIL:

Informações Sobre a Pesca Marítima no Nordeste Brasileiro--Estados do Maranhão e Bahia (Information on the Maritime Fish of North Brazil--States of Maranhão and Bahia), by Rui Simões de Menezes, 20 pp., processed in Portuguese, Assessor de Pesca do Governo do Estado da Bahia, Caixa Postal, 1, 366, Bahia, Brazil, 1960.

CALIFORNIA:

California Fish and Game, vol. 48, no. 3, July 1962, pp. 151-211, illus., printed, single copy 75 cents. Department of Fish and Game, Printing Division,

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Documents Section, Sacramento 14, Calif. Includes, among others, the following articles: "Catch Records from the Striped Bass Sportfishery in California," by Harold K. Chadwick; "The 1960 Preseason Albacore Survey in the Northeastern Pacific Ocean," by William L. Craig and Robert H. Cane-day; "The Electrophoretic Characteristics of Albacore, Bluefin Tuna, and Kelp Bass Eye Lens Proteins," by Albert C. Smith; and "An Unusual Catch of a Large Number of Pacific Round Herring Off Long Beach, California," by John G. Carlisle, Jr.

CANADA:

Progress Reports of the Pacific Coast Stations, no. 114, 35 pp., illus., printed, 35 Canadian cents. Fisheries Research Board of Canada, Ottawa, Canada, June 1962. (Available from Queen's Printer and Controller of Stationery, Ottawa, Canada.) Includes, among others, the following articles: "Packaging Air Shipments of Fresh Fish," by F. G. Claggett; "A New Method for Unloading Fish," by S. W. Roach and J. S. M. Harrison; "Abalones in British Columbia," by D. B. Quayle; "Pollution in Coastal Waters of British Columbia," by Michael Waldichuk; and "Frozen Albacore Tuna--The Influence of Storage Conditions Prior to Freezing," by N. Tomlinson, Shirley E. Geiger, and Eve Roberts.

CANNING:

"La Industria Conservera Portuguesa" (Portuguese Fish Canning Industry), article, Industria Conservera, vol. 28, no. 275, May 1962, pp. 111-112, printed in Spanish. Union de Fabricantes de Conservas de Galicia, 41 Marques de Valladares, Vigo, Spain.

COMMUNIST CHINA:

Marine Biology in China During the Past Decade, by Tseng Ch'eng-K'wei, OTS No. 60-11, 776, 13 pp., processed, 50 cents, June 26, 1960. Technical Services, U. S. Department of Commerce, Washington 25, D. C.

CRAYFISH:

"The Female Reproductive Cycle of the Crayfish Cambarellus shufeldti: The Influence of Environmental Factors," by Mildred Eileen Lowe, article, Tulane Studies in Zoology, vol. 8, no. 6, July 14, 1961, pp. 157-176, illus., printed. Tulane University, New Orleans, La.

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DENMARK:

Journal du Conseil, vol. 27, no. 2, May 1962, pp. 119-216, illus., printed, single copy Kr. 16 (about US\$2.35). Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund Slot, Denmark. (Available from Messrs. Andr. Fred. Host & Son, Bredgade, Copenhagen, Denmark.) Includes, among others, these articles: "The Use of Electronic Sector-Scanning Sonar for Following the Movements of Fish Shoals: Sea Trials on R.R.S. Discovery II," by F. R. Harden Jones and B. S. McCartney; "The Influence of Wind and Tide on the Catch by Drift Nets in the East Anglian Herring Fishery 1952-1956," by G. C. Bolster; "On the Correlation Between the Arrival and Spawning of the Norwegian Winter Herring," by Olav Aasen; "Reactions of Larval and Young Salmonids to Water of Low Oxygen Concentration," by H. M. Bishai; and "Reactions of Larval and Young Salmonids to Different Hydrogen Ion Concentrations," by H. M. Bishai.

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ELECTRIC FISH SCREENS:

"Keep Out Fish Electrically," by R. E. Dodson, article, American City, vol. 76, no. 2, pp. 95-96, printed. American City Magazine Corp., 470 Fourth Ave., New York 16, N. Y.

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Agricultural Commodities and the European Common Market (13 FAO Commodity Policy Studies), CCP 62/8, 69 pp., printed, \$1.00. Food and Agriculture Organization of the United Nations, Commodities Division, Viale delle Terme di Caracalla, Rome, Italy, 1962. The purpose of this study is to provide information and some preliminary analysis with respect to the role of major agricultural commodities under the provisions of the Treaty of Rome of 1957 which created the European Common Market, and proposals under consideration for putting these provisions into effect. Includes an assessment of the possible effects of the establishment of the European Common Market on the agricultural trade of the rest of the world. Also discusses the possible consequences of the entry of the United Kingdom and the associa-

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tion of Commonwealth countries. Although fishery products and fisheries are not specifically covered, some of the general concepts may also be applicable to fisheries.

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"A Device for Feeding Brine Shrimp to Fishes" by John G. VanDerwalker and Edward Chin, article, Transactions of the American Fisheries Society, vol. 91, no. 2, 1962, pp. 230-231, illus., printed, Secretary, American Fisheries Society, P. O. Box 483, McLean, Va.

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An Analysis of the Mechanism of Distribution of Fish in a Temperature Gradient, by V. Ivlev, Translation Series No. 364, 8 pp., illus., processed, (Translated from the Russian Zoologicheskii Zhurnal, vol. 39, no. 4, 1960, pp. 494-499.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B.C., Canada, 1961.

"Conditioning in Fish: Effects of X-Irradiation," by Barron B. Scarborough and Robert G. Addison, article, Science, vol. 136, no. 3517, May 25, 1962, pp. 712-713, illus., printed, American Association for the Advancement of Science, 1515 Massachusetts Ave., NW., Washington 5, D. C.

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Artificial Fishing Reefs (Report on the Meeting Regarding Artificial Reefs, Annapolis, Md., April 28, 1960), by George M. Staples III, 20 pp., processed, Consulting Engineer, Box 66, Crisfield, Md.

FISH MEAL:

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"Speculations on Fishy Odors and Flavors," by M. E. Stansby, article, Food Technology, vol. 16, no. 4, 1962, pp. 28-32, printed, Garrard Press, 510 North Hickory, Champaign, Ill.

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A Study of the Upstream Passage of Anadromous Fish at Willamette Falls, with Recommendations for Improvements in Fish-Passage Facilities, by Harlan B. Holmes and Milo C. Bell, 233 pp.,

illus., processed, Oregon Fish Commission, 307 State Office Bldg., Portland, Oreg., 1960.

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"Effect of Fish Poisons on Water Supplies," by J. M. Cohen, G. A. Rourke, and R. L. Woodward, article, Journal of the American Water Works Association, no. 53, 1961, pp. 49-62, printed, American Water Works Association, 521 Fifth Ave., New York 17, N. Y.

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Mathematical Model of the Fish Population Considering the Change of the Availability, by Ichiro Yamamoto, Bulletin of the Japan Sea Regional Fisheries Research Laboratory No. 8, 97 pp., illus., printed in Japanese with English abstract, Japan Sea Regional Fisheries Research Laboratory, Niigata, Japan, March 1961.

"O Formakh Prisposoblenii k Samoregulyatsii Chislennosti Populyatsii u Ryb," (Types of Adaptation to Self-Regulation of Population Size in Fish), by G. V. Nikols'kii, Biological Abstracts, vol. 36, no. 23, 1961, abst. no. 79139, printed, University of Pennsylvania, 3815 Walnut St., Philadelphia 4, Pa.

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"Post-Rigor Changes in Nitrogen Distribution and Texture of Fish During Storage in Crushed Ice," by M. N. Moorjani and others, article, Food Technology, vol. 16, no. 2, February 1962, pp. 80-84, printed, The Garrard Press, 510 No. Hickory St., Champaign, Ill.

FOOD AND AGRICULTURE ORGANIZATION:

Multilingual Vocabulary and Notation for Fishery Dynamics, by S. J. Holt, 42 pp., printed, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1959.

Proceedings of the World Scientific Meeting on the Biology of Sardines and Related Species (Meeting held in Rome 14-21 September 1959), edited by H. Rosa, Jr., and Garth Murphy, vols. I, II, and III, 1,403 pp., illus., processed in English with summaries in French and Spanish, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1960. The objectives of the meeting were to appraise the status of knowledge on certain major aspects of the biology of sardines and related species, to examine and appraise the methods in research being used in the study of these aspects, and to indicate the lines along which national and international action might be developed, with a view to obtaining improvement in the methods and development of the research programs. The discussions exposed many problems, especially with regard to terminology, the study of the vulnerability and accessibility of stocks, and the identification of population units and measurements. The three volumes present the texts of contributed documents and the results of these discussions.

World Fisheries Abstracts, List of Periodicals Searched as at 31 December 1959, Supplement to vol. 12, no. 1, 11 pp., printed, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1962.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

FOODS:

Practical Food Microbiology and Technology, by Harry H. Weiser, 355 pp., illus., printed, \$11 in U. S. and \$12 foreign. The AVI Publishing Co., Inc., Westport, Conn., 1962. To emphasize a few basic concepts that are related to some of the biochemical changes induced by microorganisms from a practical viewpoint in processing certain foods is the purpose of this book. The preface points out that "obviously the composition of foods will influence the kind and nature of biochemical changes caused by microorganisms in food." Food spoilage is discussed with emphasis on appropriate control measures. Food additives, including antibiotics, are stressed because they are legally used in some cases while in other instances they may be detrimental. The role of radiation in food technology is explained and discussed. Food poisoning is emphasized because it is on the increase in spite of the sanitary measures taken at the present time. A discussion on sources and treatment of water supplies is stressed. But no attempt is made to list microbial standards for raw and processed foods because that information is available from various sources. The chapters on food and man, composition of foods, and enzymes should be of interest to any food processor or handler. Fish and fishery products are mentioned in several places. The chapter on microbiology of meats discusses briefly the preservation of fish (including icing, salting, smoking, freezing, and canning); microbiology of fish, shellfish meats, and shellfish meat products; microbiology of oysters and shellfish; inspection of oysters for harmful organisms; propagation of oysters; public aspects of oyster production; purification of oysters; survival of enteric organisms in shellfish; the biology of oysters; public health significance of paralytic shellfish poison. Since more and more of the fishery products are being packed in advanced forms of processing, this book should be of interest to processors, buyers, sellers, and users of fishery products.

--Joseph Pileggi

Symposium on Foods: Lipids and Their Oxidation, Editor, H. W. Schultz, Assistant Editors--E. A. Day and R. O. Simmhuber, 452 pp., illus., printed, \$3 in U. S., \$3.50 foreign (includes packing). The AVI Publishing Co., Inc., Westport, Conn., 1962. The present knowledge of oxidative deterioration of lipids, particularly as related to foods, is reviewed and appraised in this book. It contains the 21 papers presented by international authorities at the second biennial Symposium on Foods arranged by the Department of Food and Dairy Technology, Oregon State University, in September 1961. Discussions which followed each of the papers are also included to provide additional information. To focus the attention of scientists on the acceptability and toxicological implications of oxidation of lipids in natural and prepared foods was the purpose of the meeting. The book is made up of 22 chapters divided into five sections. The first chapter and section introduces the subject of oxidative deterioration of food lipids. The other sections cover mechanisms and products of lipid oxidation; factors affecting lipid oxidation (includes a chapter on high-energy irradiation); autoxidation in foods (includes

a chapter on marine products); biological significance of autoxidized lipids (includes a chapter on nutritional effects and thermally polymerized fish oils). The chapter on marine products points out that "fish products are more rapidly oxidized and the reactions are more complicated than those of other foods, mainly because the kinds of fatty acids present are more highly unsaturated and more numerous." The chapter discusses fresh fish, cooked fish, frozen fish, freeze-dried fish, fish meal, fish oils, and the use of antioxidants in fish products. Of course, the book is an excellent reference work for use by all persons interested in lipids of foods generally, but anyone interested in fishery products and byproducts also will find it useful. The National Institutes of Health provided financial assistance not only for conducting the symposium, which is the basis of the book; but also for making it possible to sell the book at below the usual price.

--Joseph Pileggi

FOOD SANITATION:

General Principles of Food Sanitation, FDA Publication No. 16, 22 pp., illus., printed. (Reprinted from Microscopic-Analytical Methods of Food and Drug Control, Food and Drug Technical Bulletin No. 1, pp. 7-27.) Food and Drug Administration, U. S. Department of Health, Education, and Welfare, Washington 25, D. C. The first two chapters of Technical Bulletin No. 1 attempt to show the place of sanitation in good commercial production and to outline the general principles of factory and product control. The reprint can assist administrative and sanitation personnel in understanding basic concepts of sanitation.

FREEZING:

"Freezing on Board Fishing-Boats," by G. Giannesi, article, La Peche Maritime, vol. 40, no. 999, June 1961, pp. 382-392, illus., printed in French. La Peche Maritime, 190 Blvd. Haussmann, Paris, France.

GERMAN FEDERAL REPUBLIC:

Versuche zur Fangausweitung durch Aenderung der Fangtechnik 1958/59 (Experiments on Increasing the Catch by Variation of the Catch Technique, 1958/59), by A. v. Brandt and others, 64 pp., illus., processed in German. (Reprinted from Protokolle zur Fischereitechnik, vol. 6, no. 25, September 1959.) Institut für Netz und Materialforschung, Bundesforschungsanstalt für Fischerei, Hamburg, Germany.

Versuche zur Fangausweitung durch Andefung der Fangtechnik, 1959/60 (Experiments on Increasing the Catch by Variation of the Catch Technique, 1959/60), 140 pp., illus., processed in German. (Reprinted from Protokolle zur Fischereitechnik, vol. 6, no. 27/28, April 1960, pp. 156-295.) Institut für Netz und Materialforschung, Bundesforschungsanstalt für Fischerei, Hamburg, Germany.

GIBRALTER:

Erläuterungen zur Bathymetrischen Karte der Strasse von Gibraltar (Explanations on the Bathymetric Map of the Strait of Gibraltar), by Gunter Giermann, Bulletin de l'Institut Oceanographique Nos. 1218A and

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

1218B, 31 pp., and 5 charts, printed in German with French and English summaries. Musée Océanographique, Monaco-Ville, Monaco, October 30, 1961.

GRAYLINGS:

Sistematička i Ekologija Lipljena Jugoslavije (The Systematics and Ecology of Graylings, *Thymallus thymallus* L., in Yugoslavia), by Draga Janković, 148 pp., illus., printed in Serbo-Croatian with English summary, Biological Institute, Belgrade, Yugoslavia, 1960.

GREAT LAKES:

"Our Stake in the Great Lakes Fisheries," by John R. Greeley, article, The Conservationist, vol. 16, no. 3, December-January 1961-62, pp. 14-15, illus., printed, single copy 50 cents. The Conservationist, Room 335, State Campus, Albany, N. Y.

HAKE:

"Analysis Bromatológico Comparativo en Merluza (MERLUCCIUS GAYI) Entera y Eviscerada (Comparative Analysis of Composition of Hake, *Merluccius gayi*, Whole and Eviscerated), by Omar Rojas J. and Berta Lorca P., Difusión Pesquera Cartilla de Pesca, 4, 22 pp., illus., processed. Departamento de Pesca y Caza, Ministerio de Agricultura, Dirección de Agricultura y Pesca, Santiago, Chile, June 1962.

HALIBUT:

"Movement of Tagged Halibut Off New England--II," by Albert C. Jensen and John P. Wise, article, Transactions of the American Fisheries Society, vol. 90, no. 4, 1961, pp. 489-490, printed. Secretary, American Fisheries Society, P. O. Box 483, McLean, Va.

HERRING:

Growth and Recruitment in the Herring of the Southern North Sea, I, by A. C. Burd; and Recruitment to the North Sea Herring Stocks, II, by D. H. Cushing, Fishery Investigations Series II, vol. 23, no. 5, 1962, 73 pp., illus., printed, \$4.50. Ministry of Agriculture, Fisheries and Food, London, England. (For sale by British Information Services, 45 Rockefeller Plaza, New York 20, N. Y.) The purpose of Part I is to show that the general pattern of the biology of the southern North Sea herring is dependent on their growth rate, and also that southern North Sea herring recruit to the adult stock at a given length, the Critical Length, irrespective of age. It discusses the distribution and the growth rates of the Downs and Bank herring stocks; the adult broods; and recruit age groups of the East Anglican distributions; relationship between *Calanus*--preferred food of the herring--and herring growth; and recruitment to East Anglia. Part II discusses two patterns of recruitment--the prewar pattern and the post-1952 pattern; the effect of available food on recruitment; and related information. Extensive statistical data are also included.

Herring (Selected Articles from Soviet Periodicals), 158 pp., illus., printed, \$1.50. The Israel Program for Scientific Translations, Jerusalem, 1961. (For sale by the Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.) Contains translations of articles on herring, as follows: "Some Factors Determining the Abundance of Clupeidae," by A. N. Svetovidov; "Herring of the Barents

Sea," by Z. A. Borodatova; "The Catches of Small Kan-dalaksha Herring in Spring 1929," by I. M. Germasimov; "The Herring with Low Vertebral Count (*Clupea harengus pallasi Val.*) of the Barents and Kara Seas," by V. K. Esiyov; "The Reproduction and Life-Cycle of the Murmansk Herring (*Clupea harengus harengus L.*)," by T. S. Rass; "Morphophysiological Characters of the Kara Sea Herring," by M. E. Makushok; "The Abundance of South Sakhalin Herring," by A. N. Probatov; "Biology of Foraging Herring Inhabiting the Waters of Southwestern Kamchatka and the Northern Kuril Islands," by I. A. Piskunov; "Distribution and Abundance of Spawning Herring Near the Eastern Coasts of the Sea of Japan," by A. N. Probatov.

ICES Herring Tagging Experiments in 1957 and 1958, by Olav Aasen and others, Rapports et Procés-Verbaux des Reunions, vol. 152, September 1961, 50 pp., illus., printed, Kr. 15 (about US\$2.20). Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund Slot, Denmark.

INDIA:

Fisheries of Maharashtra, 25 pp., illus., printed. Department of Fisheries, Government of Maharashtra, Sachivalaya, Bombay-32, India, April 1961.

INDUSTRIAL WASTE:

"Damage to Fish by Industrial Waste Waters," by W. Schnemann, article, Beseitigung und Reinigung, pp. 60-71, printed in German. Beseitigung und Reinigung industrieller Abwasser, R. Oldenbourg, Munich, Germany.

INSECTICIDES:

"Aerial Forest Spraying in Canada in Relation to Effects on Aquatic Life" (Transactions of the 2nd Seminar of Biological Problems of Water Pollution, 1959), by F. E. Webb, Technical Report W60-3, pp. 66-70, printed. Robert A. Taft Sanitary Engineering Center, Public Health Service, Cincinnati, Ohio.

"Bio-Assays to Determine the Toxicity of Pesticides to Aquatic Invertebrates," by A. R. Gaufin, article, Proceedings of the 15th Industrial Waste Conference, No. 106, pp. 94-98, printed. Engineering Extension Service, Purdue University, Lafayette, Ind.

"Effects of Forest Insect Spraying on Trout and Aquatic Insects in some Montana Streams" (Transactions of the 2nd Seminar of Biological Problems of Water Pollution, 1951), by R. J. Graham, Technical Report W60-3, pp. 62-65, printed. Robert A. Taft Sanitary Engineering Center, Public Health Service, Cincinnati, Ohio.

"Effects on Young Salmon of Forest Spraying with DDT" (Transactions of the 2nd Seminar of Biological Problems of Water Pollution, 1959), by C. J. Kerswill and others, Technical Report W60-3, p. 71, printed. Robert A. Taft Sanitary Engineering Center, Public Health Service, Cincinnati, Ohio.

"Herbicides" (Transactions of the 2nd Seminar of Biological Problems of Water Pollution, 1959), by C. R. Walker, Technical Report W60-3, p. 272, printed. Robert A. Taft Sanitary Engineering Center, Public Health Service, Cincinnati, Ohio.

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"The Retention of DDT by Trout and Whitefish" (Transactions of the 2nd Seminar of Biological Problems of Water Pollution, 1959), by O. B. Cope, Technical Report W60-3, pp. 72-75, printed, Robert A. Taft Sanitary Engineering Center, Public Health Service, Cincinnati, Ohio.

"The Toxicity of Organic Phosphorus and Chlorinated Hydrocarbon Insecticides to Fish" (Transactions of the 2nd Seminar of Biological Problems of Water Pollution, 1959), by C. Henderson, Q. H. Pickering, and C. M. Tarzwell, Technical Report W60-3, pp. 76-88, printed, Robert A. Taft Sanitary Engineering Center, Public Health Service, Cincinnati, Ohio.

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"Toxicological Investigations on Insecticides in Water," by G. Bringmann and R. Kuhn, article, Gesundheits-Ingenieur, no. 81, pp. 243-244, printed in German, R. Oldenbourg, G.m.b.H., Munich 1, Germany.

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The Eighth Annual Report and Accounts of the Sea Fisheries Board for the Year Ended March 31, 1960, 27 pp., illus., printed in Irish and English, An Bord Iascaigh Mhara, 67 Lower Mount St., Dublin 2, Ireland.

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JAPAN:

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acteristic Ultraviolet Absorbing Material in Rhodophyceae," by Isami Tsujino and Tsuneyuki Saito; and "Studies on the Compounds Specific for Each Group of Marine Algae. II--Extraction and Isolation of Characteristic Ultraviolet Absorbing Material in Rhodophyceae," by Isami Tsujino.

Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 12, no. 2, August 1961, pp. 93-159, illus., printed in Japanese with summaries in English. Faculty of Fisheries, Hokkaido University, Hakodate, Japan. Contains, among others, the following papers: "Exploratory Fishing of Salmon with Gill Nets of Various Mesh Sizes and with Trammel Net in Aleutian Waters, 1957," by Takeji Fujii and others; "Biochemical Studies on Muscle of Sea Animals. I--On Adenylic Acid in the Boiled Liquor with the Muscle of Scallop, *Pecten yessoensis*," by Atsushi Iida, Isao Araki, and Kiichi Murata; "Larvae and Young of the Sand-Launce (*Ammodytes hexapterus* Pallas) from the North Pacific," by Kiyo Kobayashi; and "Studies on Soluble Alginates. III--On the Metachromasy of the Soluble Alginates Lithium Alginate, Sodium Alginate, Potassium Alginate," by Miki Oguro.

Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 12, no. 3, November 1961, pp. 161-245, illus., printed in Japanese with summaries in English. Faculty of Fisheries, Hokkaido University, Hakodate, Japan. Contains, among others, the following papers: "Fatty Oil from Shellfish" by Hisanao Igarashi, Koichi Zama, and Kozo Takama; "Biochemical Studies on the Muscle of Sea Animals. II--On Color-Evaluation of Hotate-kaibashira made of Adductor Muscle of Scallop (*Pecten yessoensis*)," by Atsushi Iida and others; "Notes on the Blood of Masu Salmon (*Oncorhynchus masou*) during Up-Stream Migration for Spawning, with Special Reference to the Osmoconcentration," by Tatsuro Kubo; "Enzymatic Studies on the Muscle of Aquatic Animals. 3--The Effect of Various Inhibitors on Aerobic Glycolysis of Fish (*Cyprinidae*) and Squid (*Ommastrephes sloani pacificus*) Muscle," by Takeshi Shibata; and "Chemical Studies on the Meat of Abalone (*Haliotis discus Hannai* Ino)--I," by Eiichi Tanikawa and Jiro Yamashita.

Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 12, no. 4, February 1962, pp. 247-308, illus., printed in Japanese with summaries in English. Faculty of Fisheries, Hokkaido University, Hakodate, Japan. Contains, among others, the following papers: "On Reflection of Ultrasound from Discontinuous Boundaries in the Sea," by Masami Ishida and Noritatsu Sano; and "Chemical Studies on the Meat of Abalone (*Haliotis discus hannai* Ino)--II," by Eiichi Tanikawa, Minoru Akiba, and Jiro Yamashita.

Memoirs of the Faculty of Fisheries, Hokkaido University, vol. 9, no. 2, 1961, pp. 85-226, illus., printed. Faculty of Fisheries, Hokkaido University, Hakodate, Japan. Contains, among others, the following papers: "Studies on Bound Water in Fish Muscle," by Minoru Akiba; and "Studies on the Structure and Growth of the Scales in the Goldfish," by Jiro Yamada.

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"New Methods of Analyzing Industrial Aliphatic Lipids," by Helmut K. Mangold and Rudolf Kammerer, article, *Journal of the American Oil Chemists' Society*, vol. 39, no. 4, April 1962, pp. 201-206, illus., printed, American Oil Chemists' Society, 35 East Wacker Dr., Chicago 1, Ill.

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"Carbon Dioxide Fixation in Lobster Nerve," by Sze-Chuh Cheng and Heinrich Waelsch, article, *Science*, vol. 136, June 1962, pp. 782-783, printed, American Association for the Advancement of Science, 1515 Massachusetts Ave. NW, Washington 5, D. C.

A Contribution to the Bionomics of the Lobster (*HOMARUS VULGARIS* Edw.) on the Coast of North Wales, by A. C. Simpson, *Fishery Investigations Series II*, vol. 23, no. 7, 1961, 31 pp., illus., printed, \$2.10. Ministry of Agriculture, Fisheries and Food, London, England, (For sale by British Information Services, 45 Rockefeller Plaza, New York 20, N.Y.) Covers investigations, made in conjunction with a survey of the Welsh lobster fishery, to initiate a program of research on the bionomics and population dynamics of the lobster in the main lobster fishing areas of England and Wales. Discusses body measurements of the lobster, increase in length of the lobster on molting, time of hatching and laying eggs, time of molting, and size at first maturity. Discusses also the random feeding movements of lobsters as well as mortality rates.

"Effect of Acetylcholine on the Electrical Activity of Somatic Nerves of the Lobster," by Wolf D. Dettbarn and Floyd A. Davis, article, *Science*, vol. 136, no. 3517, May 25, 1962, pp. 716-717, illus., printed, American Association for the Advancement of Science, 1515 Massachusetts Ave. NW, Washington 5, D. C.

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The Process of Marine Fouling, by N. G. Lignau, Trans-8, 38 pp., illus., processed. (Translated from the Russian *Russische Hydrobiologische Zeitschrift*, vol. 2-3, no. 11-12, pp. 280-290 and vol. 4-5, no. 1-2, pp. 1-10.) U.S. Navy Hydrographic Office, Washington, D. C., 1961.

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"Les Filets Tournants à Thons sur les Côtes Françaises de la Méditerranée" (Purse Seines Along the French Mediterranean Coasts), by M. S. di Meglio, article, *La Peche Maritime*, vol. 41, no. 1011, June 1962, pp. 419-421, illus., printed in French. *La Peche Maritime*, 190 Blvd. Haussmann, Paris, France.

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Report of the Marine Department for the Year Ended 31 March 1962, 53 pp., printed, Marine Department, Wellington, New Zealand, 1962. Covers the activities and accomplishments of the Marine Department, including a report on fisheries for 1961. The latter discusses the quantity and value of fish and shellfish landings, fishing vessels, total landings at various ports, foreign trade in fishery products, and fish-liver oil production. It also discusses the whaling season, oysters, mussels, fresh-water and marine research, and fishery legislation. A number of statistical tables are included.

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NORTH BORNEO:

The Fresh-Water Fishes of North Borneo, by Robert F. Inger and Chin Phui Kong, 268 pp., illus., printed, \$6.50. Chicago National History Museum, Chicago, 5, Ill. Presents basic information on species now known in such a way that data can be used by future reviewers of the various groups.

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Secrets of the Sea: Oceanography for Young Scientists, by Howard Jonah Pincus, American Education Publications 342, 31 pp., illus., printed. Education Center, American Education Publications, Columbus, Ohio, 1960.

Study of the World Ocean, by E. M. Suzumov, JPRS 9695, processed. (Translated from the Russian *Vesnik Akademii Nauk SSSR*, no. 3, 1961, pp. 67-77.) Photocopies of this report may be purchased from Photoduplication Service, Library of Congress, Washington 25, D. C.

Tongue of the Ocean Research Experiment, by A. Wayne Magnitzky and Howard V. French, TR-94, ASWEP Report No. 3, 140 pp., illus., processed, \$1.10. U. S. Navy Hydrographic Office, Washington, D. C., 1960.

Two New Pacific Chaetognaths (Their Distribution and Relationship to Allied Species), by Angeles Alvarino, Bulletin of the Scripps Institute of Oceanography, vol. 8, no. 1, January 15, 1962, 53 pp., illus., printed, \$1.50. Scripps Institute of Oceanography, University of California, La Jolla, Calif.

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The Government-Industry Cooperative Oyster Research Program. Part I—History and Methodology, by Amihud Kramer and others, 14 pp., illus., printed. (Reprinted from the *Journal of the Association of Official Agricultural Chemists*, vol. 45, no. 2, May 1962.) Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington 4, D. C. This is the first of four parts of the final report of the Government-Industry Cooperative Oyster Research Program (GICORP), sponsored jointly by the Fish and Wildlife Service, the Food and Drug Administration, and the Oyster Institute of North America. GICORP was organized for the purpose of establishing the composition of the oyster in its "native" state, and the changes that occur as a result of processing, packing, and marketing. Discusses the objectives of GICORP, definition of oyster identity, and chemical, physical, and physiological methods to measure oyster identity.

"*Haplosporidium costale* (Sporozoa) Associated with a Disease of Virginia Oysters," by John L. Wood and Jay D. Andrews, article, *Science*, vol. 136, no. 3517, May 25, 1962, pp. 710-711, illus., printed. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington 5, D. C.

An Investigation of the Biology and Culture of an East African Oyster, CRASSOSTREA CUCULLATA (Born), by Vernon D. Van Soeren and P. J. Whitehead, Colonial Office Fishery Publications No. 14, printed, 27s. 6d. (USS5.50). Sales Section, British Information Services, 45 Rockefeller Plaza, New York 20, N.Y., 1961.

PACKAGING:

"Packaging of Freeze-Drieds," by T. C. Taylor, article, *Food Engineering*, vol. 33, no. 9, September 1961, pp. 41-44, illus., printed. *Food Engineering*, Chilton Co., Chestnut and 58th Sts., Philadelphia 39, Pa. Gives a comprehensive survey of packaging materials, such as cans, cartons, and flexible pouches, single and laminated, used and being developed by many producers of freeze-dried foods. Containers should be capable of offering physical protection to

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fragile and brittle products and of maintaining oxygen level below 2 percent and moisture content below 3 percent. Where products are extremely sensitive to enzymatic activity, lower levels are essential and inpackage desiccants can be used. Most producers use nitrogen to flush the container before inserting the freeze-dried food.

PERU:

Importancia Económica de la Pesquería en El Quincho: 1957-1961 (Economic Importance of the Fishing Industry for the Years 1957-1961), by Javier Iparraguirre Cortez, 118 pp., illus., printed in Spanish. Ministerio de Agricultura, Servicio de Pesquería, Lima, Peru.

PLANKTON:

Continuous Plankton Records: Contribution Towards a Plankton Atlas of the North-Eastern Atlantic and the North Sea. Part VI-The Seasonal and Annual Distributions of the Gastropoda, by F. R. Vane and J. M. Colebrook, 16 pp., illus., printed, 10s. (US\$1.40). (Reprinted from Bulletins of Marine Ecology, vol. 5, no. 49, January 1962, pp. 247-253, 9 figs., illus., printed.) Officer in Charge, Oceanographic Laboratory, 78 Craighall Rd., Edinburgh 5, Scotland.

Continuous Plankton Records: The Distribution of Young SEBASTES MARINUS (L.), by G. T. D. Henderson, 22 pp., illus., printed, 7s. (98 U. S. cents). (Reprinted from Bulletins of Marine Ecology, vol. 5, no. 46, December 1961, pp. 173-193.) Officer in Charge, Oceanographic Laboratory, 78 Craighall Rd., Edinburgh 5, Scotland.

An Ecological Survey of a Scottish Herring Fishery. Part II-Geographical and Ecological Groups in the Plankton; Part IV--Changes in the Plankton During the Period 1949 to 1959, by M. H. Williamson; Appendix: A Method for Studying the Relation of Plankton Variations to Hydrography, by M. H. Williamson, 36 pp., illus., printed, 9 s. (about U.S.\$1.26). (Reprinted from Bulletins of Marine Ecology, vol. 5, nos. 47-48, December 1961, pp. 195-229.) Officer in Charge, Oceanographic Laboratory, 78 Craighall Rd., Edinburgh 5, Scotland.

The Role of Deep Waters of Polar and Sub-Polar Origin in the Enrichment of Deep-Sea Plankton, by K. Beklemishev, 9 pp., processed. (Translated from the Russian Bull. Moscow Nat. Soc., Ser. Biol., vol. 45, no. 3, 1960.) Fisheries Laboratory, Lowestoft, Suffolk, England.

Use of the Hardy Continuous Plankton Recorder in a Fishery Research Programme, by John B. Colton and Robert R. Marak, 16 pp., illus., printed, 10s. (US\$1.40). (Reprinted from Bulletins of Marine Ecology, vol. 5, no. 49, January 1962, pp. 231-246.) Officer in Charge, Oceanographic Laboratory, 78 Craighall Rd., Edinburgh 5, Scotland.

Zooplankton in Relation to Herring in the Norwegian Sea, June 1959, by Ulf Lüe, 12 pp., illus., printed. (Reprinted from Fiskeridirektoratets Skrifter, Serie Havundersøkelser, vol. 13, no. 1.) Fiskeridirektoratet, Bergen, Norway, 1961.

PONDS AND LAKES FISHERY MANAGEMENT:

Management of Artificial Lakes and Ponds, by George W. Bennett, 300 pp., illus., printed, \$8. Reinhold Publishing Corporation, 430 Park Ave., New York 22, N. Y., 1962. The author has included the most recent scientific advances and practical techniques in artificial lake and pond management. For those interested in a comprehensive and integrated presentation of the dynamics and management of warm-water fish populations in artificial lakes and ponds, this is just the book. Students, researchers, and professional workers will find that the development of the subject is broad in scope, and well suited to their needs. The foreword interestingly points out that "Much of man's activity, either indirectly or directly, is aimed at manipulating populations." Among the examples cited is the work going on in the Great Lakes area of North America where man wishes to increase the numbers of lake trout and at the same time destroy the sea lamprey, a trout predator. The change from the "art" of management to the "science" of management is a new phenomenon which has appeared within the present century. In my opinion, the author has attempted and succeeded in bringing together and giving meaning to fish management knowledge which has been hidden in the literature and has had no meaning to the non-specialist. Specific directions, such as, for example, how to stock a lake, have been avoided. The book shows the range of reasonable stocking and its relationship to the range of potential results. A brief and concise view of fish culture is presented first. Next, artificial aquatic habitats are distinguished from natural bodies of water, are described, and categorized as much as possible. This is followed by an examination of the ecological interrelationships of fish and lake habitats and a discussion of the implications for the professional manager. Then there is a fairly thorough treatment of such large concepts as carrying capacity, productivity, growth, reproduction, competition, and predation. After discussing the theory and techniques of management, the complex problems of fishing mortality and natural mortality are taken up. The last few chapters deal with sensory perception and behavior in sport fishing and its commercial aspects. Technical terminology has been reduced to a minimum and the mathematical approach to population dynamics has been left to a listing of papers on the subject. The text of the book does not show the scientific names of the fish mentioned; however, the scientific names and the common names of all the fish mentioned appear in the Appendix. The book has a good index, and is well documented. Pond owners, professional fishery biologists, limnologists, conservation workers, government fishery experts and administrators, fishermen, and students of aquatic biology and fishery management will find the book of considerable interest and value.

--Joseph Pileggi

PORUGAL:

Gremio dos Armadores de Navios da Pesca do Bacalhau, Relatório e Contas do Exercício de 1961 e Orçamento para 1962 (Cod Fishing Vessel Owners' Guild, Statement of Operations for 1961 and Budget for 1962), 34 pp., printed in Portuguese. Comissão Revisora de Conta, Lisbon, Portugal, February 17, 1962.

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Gremio dos Armadores da Pesca de Arrasto, Relatório e Contas do Exercício de 1961 e Orçamento para 1962 (Trawler Owners' Guild, Statement of Operations for 1961 and Budget for 1962), 40 pp., printed in Portuguese. Comissão Revisora de Contas, Lisbon, Portugal, 1962.

Gremio dos Armadores da Pesca da Baleia, Relatório e Contas do Exercício de 1961 e Orçamento para 1962 (Whaling Vessel Owners' Guild, Report of Operations in 1961 and Budget for 1962), 33 pp., printed in Portuguese. Comissão Revisora de Contas, Lisbon, Portugal, February 24, 1962.

Gremio dos Armadores da Pesca da Sardinha, Relatório e Contas do Exercício de 1961 e Orçamento para 1962 (Sardine Fishing Vessel Owners' Guild, Statement of Operations for 1961 and Budget for 1962), 20 pp., printed in Portuguese. Comissão Revisora de Contas, Lisbon, Portugal, January 26, 1962.

PREDATORS:

Predator-Prey Relationships Between Fish-Eating Birds and Atlantic Salmon (With a Supplement on Fundamentals of Merganser Control), by P. F. Elson, Bulletin of the Fisheries Research Board of Canada No. 133, 87 pp., printed, C\$1.00, Fisheries Research Board of Canada, Ottawa, Canada, 1962. (Available from Queen's Printer and Controller of Stationery, Ottawa, Canada.)

PRESERVATION:

"Preservation of Fish by Antibiotics and by Penetrating Radiations," by H. L. A. Tarr, article, Fishing News International, vol. 1, no. 1, October 1961, pp. 17-20, and vol. 1, no. 2, January 1962, pp. 46-48, illus., printed, Arthur J. Heighway Publications, Ltd., Ludgate House, 110 Fleet St., London EC4, England.

PROCESSING:

"Hagning Fiskaflangs, 1961" (Processing of the Fish Catch, 1961), article, Aegir, vol. 55, no. 11, June 1962, pp. 217-221, printed in Icelandic. Aegir, Fiskifelag Islands, Reykjavik, Iceland.

RADIATION:

Radiation-Processed Foods as a Component of the Armed Forces Feeding Systems, AD 268 479, 94 pp., printed, \$2.25. Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., August 1961.

RADIOACTIVE CONTAMINANTS:

"Accumulation of Radioactive Pollutants by Marine Organisms and its Relation to Fisheries" (Transactions of the 2nd Seminar of Biological Problems of Water Pollution, 1959), by W. A. Chipman, Technical Report W60-3, pp. 8-14, printed. Robert A. Taft Sanitary Engineering Center, Public Health Service, Cincinnati, Ohio.

"Investigation of the Effects of Radioactive Material on Aquatic Life in Canada" (Transactions of the 2nd Seminar of Biological Problems of Water Pollution, 1959), by I. L. Ophel, Technical Report W60-3, p. 21, printed. Robert A. Taft Sanitary Engineering Center, Public Health Service, Cincinnati, Ohio.

"The Significance of the Uptake of Radio-Isotopes by Fresh-water Fishes" (Transactions of the 2nd Seminar of Biological Problems of Water Pollution, 1959), by R. F. Foster, Technical Report W60-3, pp. 15-20, printed. Robert A. Taft Sanitary Engineering Center, Public Health Service, Cincinnati, Ohio.

REFRIGERATION:

"Prestorage of Sardines in Refrigerated Sea-Water on Board Fishing-Boats," article, Revue Conserve, vol. 16, no. 6, October 1961, pp. 133-134, printed in French. Société d'Édition pour l'Alimentation, 1 Rue de la Reale, Paris 1, France.

RESEARCH VESSELS:

"Canada's Research Vessels," by G. J. Gillespie, article, Trade News, vol. 14, no. 12, June 1962, pp. 3-6, illus., printed. Department of Fisheries, Ottawa, Canada. Describes a research trip completed by A. T. Cameron, the largest vessel operated by the Fisheries Research Board of Canada. The author explains the complexity of work carried on by Canada's 18 research vessels.

Detail Specifications for Building Oceanographic Research Ship AGS, 377 pp., and Modification Nos. 1 & 2 to Detail Specifications for Building Oceanographic Research Ship AGOR (formerly AGS), 24 pp. and 9 pp., respectively, processed. U. S. Department of the Navy, Bureau of Ships, Washington 25, D. C., Dec. 22, 1958, Feb. 24, 1960, and Mar. 25, 1960, respectively.

ROCKFISH:

Information on the Ecology of Rockfishes (Family Scorpaenidae) of the Northern Part of the Pacific Ocean, by P. A. Moiseev and I. A. Paraketsov, Translation Series No. 358, 10 pp., illus., processed. (Translated from the Russian Voprosy Ikhtioligi, vol. 1, no. 1(18), 1961, pp. 39-45.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B.C., Canada, 1961.

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Acclimatization of Pacific Salmon in the Barents and White Seas, by A. Isaev, Translation Series No. 361, 7 pp., processed. (Translated from the Russian Voprosy Ikhtioligi, vol. 1, no. 1(18), 1961, pp. 46-51.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B.C., Canada, 1961.

On the Artificial Raising of the Level of Water on the Spawning Grounds of Far-Eastern Salmon, by I. S. Vasilev, Translation Series No. 351, 2 pp., processed. (Translated from the Russian Rybnoe Khoziaistvo, no. 7, 1957, pp. 70-71.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B.C., Canada, July 1961.

Body-Scale Relationship in Atlantic Salmon (Preliminary Report), by Arne Lindroth, International Council for the Exploration of the Sea—Salmon and Trout Committee no. 104, 25 pp., printed. International Council for the Exploration of the Sea, Charlottenlund Slot, Denmark.

"The Influence of Salinity on the Rate of Oxygen Consumption of Young Quinault Salmon, *Oncorhynchus tshawytscha*," by J. S. Bullivant, article, New Zealand Journal of Science, vol. 4, 1961, pp. 381-391,

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Local Stocks of Autumn Chum Salmon in the Amur Basin, by L. Birman, Translation Series No. 349, 22 pp., processed. (Translated from the Russian Voprosy Ikhtiologii, no. 7, 1956, pp. 158-173.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B.C., Canada, 1961.

Local Stocks of Summer KETA, ONCORHYNCHUS KETA (Walbaum), of the Amur Basin, by A. Svetovidova, Translation Series No. 347, 16 pp., illus., processed. (Translated from the Russian Voprosy Ikhtiologii, no. 17, 1961, pp. 14-23.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B.C., Canada, 1961.

Marine Tagging of Fraser River Sockeye Salmon, by L. A. Verhoeven and E. B. Davoff, Bulletin XIII, 132 pp., illus., printed. International Pacific Salmon Fisheries Commission, New Westminster, B.C., Canada, 1962.

The Stocks of West Kamchatka Salmon and Their Commercial Utilization, by R. Semko, Translation Series no. 288, 131 pp., illus., processed. (Translated from the Russian Zapadnokamchatskikh lososei i ikh promyslovoe ispol'zovanie.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B.C., Canada, 1960.

SARDINES:

"La Peche a la Sardine sur les Cotes Francaises de Meditterraine" (Sardine Fishing Along the French Mediterranean Coasts), by L. Zali, article, La Peche Maritime, vol. 41, no. 1011, June 1962, pp. 414-418, illus., printed in French. La Peche Maritime, 190 Blvd. Haussmann, Paris, France.

Sur Une Alteration des Caracteristiques d'Age des Populations de Sardine Pechees au Nord du Portugal (On the Change in Age Characteristics of Sardine Populations Fished in Northern Portugal), by J. Amorim Machado-Cruz, Publicacoes do Instituto de Zoologia No. 73, 13 pp., illus., printed in French. (Reprinted from Anais da Faculdade de Ciencias do Porto, vol. XLIII.) Instituto de Zoologia, Faculdade de Ciencias do Porto, 108 Rua Formosa, Porto, Portugal, 1960.

SCALLOPS:

"Giant Scallops in Newfoundland Coastal Waters," by H. J. Squires, Bulletin of the Fisheries Research Board of Canada No. 135, 29 pp., printed, 50 Canadian cents. Fisheries Research Board of Canada, Ottawa, Canada, 1962. (Available from Queen's Printer and Controller of Stationery, Ottawa, Canada.)

Gulf of St. Lawrence Scallop Explorations, 1961, by N. Bourne and A. McIver, Circular No. 35, 4 pp., printed. Fisheries Research Board of Canada, Biological Station, St. Andrews, N.B., Canada, 1962.

SHARKS:

"What You Should Know About Sharks (Part 2)," by Edward Waldo, article, Louisiana Conservationist, vol. 14, nos. 7-8, July-August 1962, pp. 6-8, illus., printed. Louisiana Wild Life and Fisheries Com-

mission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans 16, La. This is the second part of an article on sharks. Describes primarily the characteristics of sharks' teeth. Discusses variations of teeth found in different species, power of the teeth and how this power is used as a weapon for attack and defense, citing several examples. Also lists the common species of sharks, giving their common and scientific names, and their maximum sizes.

SHRIMP:

Dados Sobre Modificacao do Peso do Camarao, Proveda Pelo Metodo de Conservacao Empregado no Entreposto de Pesca de Cananeia (Data on Changes of Weight in the Shrimp Induced by a Conservation Method Used at the Fishery Rearing Station of Cananeia), by Victor Sadowski and Alexandre Radaskewski, no. 147, 5 pp., illus., processed in Portuguese. (Reprinted from Universidade de Sao Paulo Contribucoes Avulsas do Instituto Oceanografico, Tecnologia No. 1, 1960.) Universidade de Sao Paulo, Instituto Oceanografico, Sao Paulo, Brazil, 1960.

"Shrimp Fleet Blessing--Colorful Louisiana Ceremony," by Jack Britt, article, Louisiana Conservationist, vol. 14, nos. 7-8, July-August 1962, pp. 12-13, illus., printed. Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans 16, La.

Use of Stains in Shrimp Mark-Recapture Experiments, by T. J. Costello, Contribution no. 23, 5 pp., printed. International Commission for the Northwest Atlantic Fisheries, Forrest Bldg., Carleton St., Halifax, Nova Scotia, Canada. Paper presented at the ICNAF North Atlantic Fish Marking Symposium, May 1961.

SMALL BUSINESS MANAGEMENT:

Electric Motor Maintenance for Small Plants, Technical Aids No. 80, 4 pp., printed. Small Business Administration, Washington 25, D. C. The common causes of electric motor trouble are identified and some of the ways to keep electric motors running are discussed. Electric motors, like any other equipment, can only be maintained economically when they are fitted for the service they are expected to perform. Whether AC or DC motors are selected to run the machinery, they must be properly applied and correctly installed. Only then can proper maintenance reduce the chances of motor failure and the accompanying costs in repairs.

Problems and Prospects of South Carolina Food Processors, by Olin S. Pugh, Robert L. King, and W. F. Putman, Management Research Summary, 4 pp., processed. Small Business Administration, Washington 25, D. C., April 1962. A summary of a report on problems and prospects of South Carolina food processors. The findings of the report represent extensive research in the over-all aspects of food processing in South Carolina. Besides providing a factual analysis of the State's food processing industries, the study aimed to determine the managing, marketing, and operating problems of the eight major categories of the food and kindred products industries, how they were being resolved, and what the future prospects were.

Sound Objectives Help Build Profits, Management Aids No. 142, by T. Stanley Gallagher. 4 pp., printed. Small

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Business Administration, Washington 25, D. C. A report on how sound objectives help build profits. It discusses the desirability of formulating and formalizing company goals, as well as the continuing need for reviewing such objectives in order to keep them current and sound. By setting up specific business objectives, small businessmen can provide their organizations with an efficient blueprint to guide company progress in an orderly manner. By reviewing objectives periodically, small businessmen can learn: (1) whether their objectives need to be adjusted, and (2) what, if any, policy and procedure changes are needed in order to achieve current goals.

SNAPPER:

The Shark Bay Fishery on Snapper (CHYSOPHRYNS UNICOLOR), by B. K. Bowen, Report I, 18 pp., illus., printed. Fisheries Department, 108 Adelaide Terrace, Perth, Australia, 1961.

SOUTH AFRICA REPUBLIC:

Fishing Industry Research Institute (Fourteenth Annual Report of the Director, 1 January-31 December 1960), 47 pp., illus., printed. Fishing Industry Research Institute, University of Cape Town, Rondebosch, South Africa. Discusses part played by the Fishing Industry Research Institute of Cape Town in solving factory production problems and in research on the scientific background to fish processing. Outlines investigations undertaken by the Institute on fresh and frozen fish; salted and dried fish; fish canning; fish sausage; use of fish flour as the basis for new food products; fish meal; and stickwater recovery. The primary emphasis of research was on fish meal and fish oils; variation of fish meal composition during production; moisture distribution vs. particle size of fish meals; methods of estimating the digestibility of fish meals; available lysine in fish meal; oxidation of fish oils; drying of fish oils with silica gel; and apparatus for spontaneous heating tests. Also discusses routine chemical and bacteriological analyses as well as routine investigations on frozen fish; frozen rock lobster tails for export; canned fish and rock lobster; fish meal sampling and supervision of loading; fish meal bags; and tomato paste.

Index to the Publications of the Fishing Industry Research for the First Ten Years 1947-1957, by J. S. Dunn, 63 pp., printed. Fishery Industry Research Institute, Cape Town, South Africa Republic, 1958.

SOUTH DAKOTA:

Fishes of South Dakota, by Reeve M. Bailey and Marvin O. Allum, 131 pp., illus., printed, \$2.50. University of Michigan, Museum of Zoology, Ann Arbor, Mich. It gives a short history of South Dakota ichthyology, collecting stations, and annotated list of fish.

SPAIN:

Sobre Algunos Peces Poco Frecuentes o Desconocidos en la Costa Vasca (On Some Rare and Unknown Fish on the Basque Coast), by Jose Mari Navaz y Sanz, Publication No. 14, 57 pp., illus., printed in Spanish. Sociedad de Oceanografia de Guipuzcoa, San Sebastian, Spain, 1961.

SPINY LOBSTERS:

"The Freezing of Spiny Lobster Tails," by J. Deniel and J. Nouy, article, La Peche Maritime, vol. 40, no. 999, June 1961, pp. 402-412, illus., printed in French. La Peche Maritime, 190 Blvd. Haussmann, Paris, France.

"On the Occurrence of the Spiny Lobster, Panulirus dentatus (H. Milne-Edwards) in Bombay Waters, with a Note on the Systematics of Bombay Lobsters," by B. F. Chhapgar and S. K. Deshmukh, article, Jour- nal of the Bombay Natural History Society, vol. 58, no. 3, December 1961, pp. 632-638, illus., printed. Bombay Natural History Society, 91 Walkeshwar Rd., Bombay 6, India.

STANDARDS:

Index to Microscopic-Analytical Methods in Food and Drug Control, Food and Drug Technical Bulletin No. 1, 14 pp., printed. Food and Drug Administration, U. S. Department of Health, Education, and Welfare, Washington 25, D. C., 1962. An index to Technical Bulletin No. 1, entitled "Microscopic-Analytical Methods in Food and Drug Control," which discusses the latest methods for microscopic identification of contaminants in foods and drugs and is designed to help analysts trace adulterants to their sources.

STURGEON:

The Lake Sturgeon, by W. J. K. Harkness and J. R. Dymond, illus., printed. The Ontario Department of Lands and Forests, Toronto, Ontario, Canada. This account of the lake sturgeon covers distribution, habits, food, growth, reproduction, artificial propagation, fishing methods, the fishery itself, and conservation of the species. The largest lake sturgeon of which there is authentic record weighed 310 pounds. It was caught in Batchewana Bay, Lake Superior, in 1922, and a more recent fish of the same weight was caught in Lake Michigan in 1943. Each was nearly eight feet long. Larger ones are reported to have been taken in earlier times, but their weight cannot be authenticated. The lake sturgeon has much larger relatives; a white Oregon sturgeon taken in the Columbia River was 12.5 feet long and weighed 1,285 pounds. Prejudice against eating sturgeon seems to have been based partly on the fact that many people did not know how to prepare it, although French Canadians are said to have used it for bouillon and also to have pickled it. Much of the low opinion of the species, however, was based on its destructiveness to nets and worthlessness as a commercial fish as well as to the belief that it was destructive to more valuable food fish. It was the practice of smoking sturgeon and the use of their roe in making caviar that led to an active demand, and by 1880 the sturgeon fishery had become an important branch of the fishing industry.

TEXAS:

A Checklist of Texas Fresh-Water Fishes, by Clark Hubbs, IF Series-No. 3, 12 pp., printed. Division of Inland Fisheries, Texas Game and Fish Commission, Austin, Tex., revised December 1958.

TEXTURE OF FISH:

"Development of an Instrument for Evaluating Texture of Fishery Products," by John A. Dassow, Lynne

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G. McKee, and Richard W. Nelson, article, Food Technology, vol. 16, no. 3, 1962, pp. 108-110, illus., printed, Garrard Press, 510 North Hickory, Champaign, Ill.

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"Application of Centrifugal Method for Measuring Shrinkage During the Thawing and Heating of Frozen Cod Fillets," by D. Miyachi, article, Food Technology, vol. 16, no. 1, January 1962, pp. 70-72, illus., printed, Garrard Press, 510 No. Hickory St., Champaign, Ill.

"Das Dielektrische Auftauen Schnellgefrorener Lebensmittel" (Dielectric Thawing of Frozen Food-stuffs), by O. Lang, article, Die Kalte, vol. 41, no. 10, November 1961, pp. 615-618, illus., printed in German, Hans A. Keune Verlag, Pressehaus, 1 Speersort, Hamburg 1, Germany.

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In Defense of Certain Conditions in the Designing of Fishing Trawlers, by E. Muragin, O.N.I. Translation No. 852, 9 pp., processed, (Translated from the Russian Rybnoe Khoziaistvo, vol. 11, 1960, pp. 27-33.) Office of Naval Intelligence, Translations Section, Washington 25, D. C.

"Lord Nelson, First British Trawler with Partial Freezing, has an Aft Ramp," by M. B. F. Ranken, article, La Peche Maritime, vol. 40, no. 999, June 1961, pp. 393-397, illus., printed in French, La Peche Maritime, 190 Blvd. Haussmann, Paris, France.

TRAWLING:

Our Observation on the Behavior of the Trawl in Water, by N. A. Lyapin, OTS60-51080, 6 pp., illus., processed, 50 cents, (Translated from the Russian Rybnoe Khoziaistvo, vol. 35, no. 2, 1959, pp. 43-46.) Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.

"Treuils de Manoeuvre de Chalut a Entrainement Electrique ou Electro-Hydraulique des Chantiers Seebeck" (Tests of Trawl Operated by Electrical or Hydraulic-Electrical Device of the Seebeck Shipyard), article, La Peche Maritime, vol. 41, no. 1011, June 1962, pp. 446-447, illus., printed in French, La Peche Maritime, 190 Blvd. Haussmann, Paris, France.

TRAWL NETS:

Trawl Mesh Regulation in the Strait of Georgia, by K. S. Ketchen, Circular No. 61, 16 pp., printed, Fisheries Research Board of Canada, Biological Station, Nanaimo, B.C., Canada, 1961.

TROUT:

"Physical Characteristics and Chemical Composition of Two Subspecies of Lake Trout," by Claude E. Thurston, article, Journal of the Fisheries Research Board of Canada, vol. 19, no. 1, 1962, pp. 39-44, illus., printed, Queen's Printer and Controller of Stationery, Ottawa, Canada.

TUNA:

"Fundamental Studies on the Prevention of Discoloration of Frozen Yellow-Fin Tuna Meat," by K.

Tanaka, article, Refrigeration, vol. 36, no. 409, November 1961, pp. 1-17, printed, Japanese Association of Refrigeration, Kenchiku Kaikan Bldg., 3-1 Ginza Nishi, Chuo-ku, Tokyo, Japan.

Measures of Population Density and Concentration of Fishing Effort for Yellowfin and Skipjack Tuna in the Eastern Tropical Pacific Ocean, 1951-1959, by Thomas P. Calkins, Inter-American Tropical Tuna Commission Bulletin, vol. 6, no. 3, 1961, 84 pp., illus., printed in English and Spanish, Inter-American Tropical Tuna Commission, La Jolla, Calif. The primary objective of this study is to compute two indices of population density and an index of concentration of fishing effort of tuna bait boats for skipjack alone and for yellowfin and skipjack combined, and to examine the quarterly and annual variations in these indices. Secondary objectives are to examine the relationship between these indices and the dispersal of the fishery, and to demonstrate the seasonal changes in the geographical distribution of the catch-per-unit-of-effort in the skipjack fishery. The report discusses the source and routine processing of data, and the calculation of the indices. Then for skipjack alone and for yellowfin and skipjack combined, it discusses the quarterly variations in the indices of density and index of concentration; relationship between weighted and unweighted indices of density. For skipjack, the report analyzes the seasonal changes in the geographical distribution of catch-per-standardized-day's-fishing.

La Peche du Thon a la Longue-Ligne--Ses Possibilites dans les Eaux Voisines de la Nouvelle-Caledonie (Tuna Long-Line Fishing--Its Possibilities in the Neighboring Waters of New Caledonia), by Michel Angot and Rene Criou, 31 pp., illus., processed in French, Office de la Recherche Scientifique et Technique Outre-Mer, 20, rue Monsieur, Paris 7^e, France, September 1959.

"La Peche du Thon a Madagascar," Tuna Fishing in Madagascar, by A. Crosnier and P. Fourmanoir, article, Bulletin de Madagascar, vol. 11, no. 185, October 1961, pp. 867-891, illus., printed in French, M. le Directeur de l'Imprimerie Nationale, Tana-narive, Madagascar.

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A Review of Present Knowledge Relative to a Possible Tuna Fishery in New Zealand, by M. K. McKenzie, Fisheries Technical Report No. 4, 49 pp., illus., processed, New Zealand Marine Department, Wellington, New Zealand, 1962. Discusses the biology of the main species of tuna found in New Zealand, their size, distribution, season, and fishing methods used; exploratory cruises made to locate tuna concentrations; recent work done in oceanography in the Tasman Sea and coastal waters of New Zealand; and tuna boats and fishing gear. Includes also figures charting the probable distribution of the tuna species below the surface of the sea, as well as data on water temperatures. The author says northern bluefin

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is known to occur in New Zealand; striped tuna occurs in spring and autumn in the northern half of the North Island; yellowfin occurs in the summer in northern latitudes; albacore in the summer and autumn in the North Island, and southern bluefin in the spring and autumn.

Spawning of Yellowfin Tuna and Skipjack in the Eastern Tropical Pacific, as Inferred from Studies of Gonad Development, by Craig J. Orange, Inter-American Tropical Tuna Commission Bulletin, vol. 5, no. 6, 1961, 68 pp., illus., printed in English and Spanish, Inter-American Tropical Tuna Commission, La Jolla, Calif.

Tuna Fishing in Australia and Its Possible Application in New Zealand, by W. G. Sampson, Fisheries Technical Report No. 5, 43 pp., illus., processed, New Zealand Marine Department, Wellington, New Zealand, 1962. Discusses Australian tuna clippers, their fundamental requirements and special equipment; live bait tanks and holding pens, their construction and equipment; methods of capture and care of live bait fish; searching and fishing for tuna; and handling and storage of tuna on board ship. Includes illustrations of equipment used and structural and miscellaneous details on Australian tuna vessels (pole fishing).

Tunty i drugie ob'ekty tuntsovogo promysla (Tunas and Other Objects of the Tuna Fishery), by V. L. Zharov, Iu. L. Karpechenko, and G. V. Martinsen, 114 pp., illus., printed in Russian, 45 kop. (about 60 U.S. cents). VNIRO Glavniproekt, pri Gosplanie, SSSR, Moscow, U.S.S.R., 1961. The book consists of two sections entitled: "The Description of Tunas and other Objects of the Tuna Fishery" and "The Catch Statistics of the Objects of the Tuna Fishery." The following groups of fish are considered by the authors to be the objects of the tuna fishery: scombrids (tunas and mackerel-like fish), the billfish and the barracouta. Identification keys for various groups of fish are scattered throughout the book. Each species is illustrated by a text figure. The brief description of each species includes information on the following: common names in various languages, synonymy, size, habits, geographical distribution, methods of capture, economical importance, as well as the form in which the species is utilized. The statistical portion of the book contains information on the catch of various fish dealt with in the first section, containing tabulations with a world-wide coverage for the catch of various countries for the years 1938 and 1947 through 1958.

-W. L. Klave, Senior Scientist,
Inter-American Tropical Tuna Commission

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others, the following articles: "Oils Utilized in Canned Fish Industry and Their Standardization;" "Main Features of Fishery Financing in Japan;" "Tuna Long-Line Fishing at Marmara and Preparations of the Materials;" and "Seasonings Utilized in Preparations of Fish Products."

UNITED KINGDOM:

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Sea Fisheries Statistical Tables, 1961, 44 pp., printed, 5s. (about 70 U.S. cents). Ministry of Agriculture, Fisheries and Food, London, England, 1962. (Available from Her Majesty's Stationery Office, York House, Kingsway, London WC2, England.) Consists of statistical data showing the quantity, value, and average value of fish and shellfish landed in England and Wales by species, region, and method of capture. The different kinds of fish are divided into three main groups: demersal, pelagic, and shellfish. Also includes data on number of fishermen and fishing vessels employed as well as quantity and value of exports and imports, 1960-1961, by kinds and countries.

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THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

UNITED STATES GOVERNMENT:

United States Government Organization Manual, 1962- 63, 766 pp., illus., printed, \$1.50. Office of the Federal Register, National Archives and Records Service, Washington, D. C., June 1, 1962. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C.) The official organization handbook of the Federal Government. Contains sections descriptive of the agencies in the legislative, judicial, and executive branches. Supplemental information includes brief descriptions of quasi-official agencies, selected multilateral international organizations, selected bilateral organizations, charts of the more complex agencies, and appendices relating to abolished and transferred agencies, and to governmental publications. Also describes the agencies connected with fisheries: U.S. Fish and Wildlife Service, Bureau of Commercial Fisheries, and Bureau of Sport Fisheries and Wildlife.

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Small Craft, Gale and Whole Gale Warning Facilities Chart, Great Lakes: Huron, Erie, and Ontario, 1962, 2 pp., processed, 10 cents. Weather Bureau, U. S.

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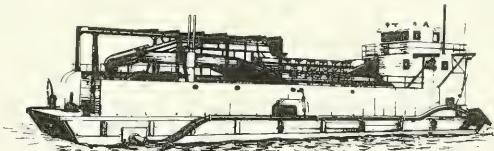
CORRECTION

In the July 1962 issue, page 120, under the heading: NATIONAL COMMISSIONS, a review of the "Report by the President on the Ninth Meeting of the Permanent Commission Held in Copenhagen, May 1961," showed the wrong address for the Commission. The correct address is: Office of the Permanent Commission, East Block, Whitehall Place, London SW1, England. The Commission's financial year 1960 ended on 30th June and not 30th July as reported in the Review.



SUCTION DREDGE

This is a special type of capturing device used almost solely in the oyster industry. The oysters are removed from the bottom and brought to the surface by action of suction applied to the dredge head which is connected to a power pump on board the dredge vessel.



Suction dredge.

Note: Excerpt from Circular 109, Commercial Fishing Gear of the United States, for sale from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., single copy, 40 cents.

Editorial Assistant--Ruth V. Keefe

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* * * * *

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ROBERT H GIBBS JR

COMMERCIAL FISHERIES REVIEW



VOL. 24 NO.11

NOVEMBER 1962

FISH and WILDLIFE SERVICE
United States Department of the Interior
Washington, D.C.



COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor

Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

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Use of funds for printing this publication has been approved by the Director of the Bureau of the Budget, May 10, 1960.

5/31/63

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COMMERCIAL FISHERIES REVIEW

November 1962

Washington 25, D. C.

Vol. 24, No. 11

PROGRESS REPORT ON MIDWATER TRAWLING STUDIES CARRIED OUT OFF THE NEW ENGLAND COAST IN 1961 BY M/V DELAWARE

By Warren F. Rathjen* and L. A. Fahlen*

ABSTRACT

Experiments with midwater trawling gear were conducted in 1961 by the U. S. Bureau of Commercial Fisheries with the research vessel Delaware. The principal objective of work in 1961 was to modify midwater trawling gear so that it could be controlled accurately. A depth-sounder transducer was mounted on the headrope of a trawl to allow a constant check to be made on the relation of the net to the bottom and to fish schools. In limited fishing trials, carried out with the transducer-equipped net, over 25 species of marine animals were sampled. Atlantic herring were caught in amounts up to 4,500 pounds per tow. Other commercially-desirable species taken included whiting (silver hake), mackerel, and butterfish. The midwater gear experiments and explorations are scheduled to continue.

INTRODUCTION

Widespread interest has developed and been maintained during the past decade in finding and using various fishery resources known to occur in mid-depths of the oceans.^{1/} Ordinary fishing techniques, such as seining and trawling, are for the most part applicable only in situations where the fish sought can be seen from the vessel or the air (as in seining) or are known to be close to or on the bottom (as in otter trawling). Some fish occurring in mid-depths have been harvested by gill nets, traps, long lines, and a few other types of gear, but more versatile gear for the midwater depths has long been needed.

Recent encouraging catches of fish by midwater trawls in the northeastern Pacific and off northern Europe have aroused interest in possible uses for this gear in other areas of the world, including the waters off the northeastern states of the United States.

Several workers (including Parrish 1959, Schaefers and Powell 1958, and Steltner 1961) have stressed that development of midwater trawling techniques depends largely on two factors: (1) finding the fish, or other marine life, in the mid-depths; and (2) controlling the fishing depth of the gear.

Finding concentrations of marine animals has been made less difficult by the development and use of sonic fish-finding devices (Kristjonsson 1959); and several ways of positioning the trawl in the proper depth have been developed in the past several years (Smith 1957, McNeely 1958). But a means of controlling the trawl so that it stays in the desired depths has only been developed recently (Scharfe 1960).

The studies under discussion here were started early in 1961 by the U. S. Bureau of Commercial Fisheries. Principal immediate objective was to obtain gear that could be placed in position and controlled readily. The experiments were designed, also, as part of a larger-scale study having the ultimate objective of establishing the availability, to commercial fishermen, of stocks of fish or invertebrates (shrimp and other animals) capable of supporting fisheries off the northeastern United States.

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^{1/}"Mid-depths" and "mid-depths resources"--also "midwater" and "midwater resources"--are terms used in this report to denote all layers and resources of the sea from just below the sea surface to immediately above the sea bottom.

BACKGROUND

Several years ago Barracough and Johnson (1956, 1960) developed a one-vessel mid-water trawl that proved successful in British Columbia waters. Schaefers and Powell (1958) used similar trawls and controlled their position in the water with a Bureau-designed depth indication device (McNeely 1958).

More recent developments in midwater gear design have come from European experiments described by Scharfe (1960). Scharfe mounted a depth-sounder transducer on the head-rope of the trawl to aid in orienting the gear during tows. This and other techniques have since been modified and used successfully in Bureau studies in the Gulf of Mexico (Bullis 1961).

Off the New England coast, various approaches to one-vessel midwater trawling have been attempted from time to time. Single-vessel trawls were used by the Bureau as sampling gear as early as 1956 in herring surveys off Maine, and a few early attempts were made by the Bureau to develop a controllable trawl for use with commercial draggers. The attempts were terminated, however, owing to the lack of proper instrumentation, time, and facilities at that time.

COVERAGE

In 1961, primary effort was devoted toward obtaining and adapting gear and establishing techniques to be used in a long-term effort aimed at defining midwater resources. Four cruises by the Delaware were carried out (table 1) with main stress on adapting suitable midwater trawls and gaining familiarity with fish-finding techniques (U. S. Fish and Wildlife Service 1961a, b, c, e). Secondary effort was devoted to supplementary sampling techniques, i. e., night-light collections and gill-net sampling.

Table 1 - Midwater Trawl Cruises of the M/V Delaware, 1961

Cruise No.	Area	Date	No. of Sea Days	Midwater Trawl Tows	Average Time Per Tow	Principal Species Represented in Catches
61-1	Nantucket Light Vessel - Hudson Canyon	Jan. 23-Feb. 2, 1961	11	8	60 minutes	Silver hake, butterfish, scup, spiny dogfish, Atlantic mackerel
61-8	Gulf of Maine - N. Georges Bank	May 24-June 7, 1961	8	16	60 minutes	Herring, mackerel, silver hake
61-11	Gulf of Maine and Georges Bank	July 6-14, 1961	9	10	60 minutes	Spiny dogfish, Atlantic herring, silver hake, butterfish, Atlantic mackerel, alewife
61-18	Gulf of Maine - Georges Bank-Nantucket Shoals	Oct. 10-18, 1961	9	6	90 minutes	Haddock (young of year), silver hake, butterfish, herring, dogfish, shrimp

During the four cruises, the midwater trawl gear was set only 40 times. Two additional sets with the gear were made on a herring survey cruise (Delaware 61-15) near Mt. Desert Island off the coast of Maine (U. S. Fish and Wildlife Service 1961d).

METHODS AND MATERIALS

Early in 1961, limited trials were made with a standard No. 36 eastern otter trawl of $2\frac{1}{2}$ -inch-mesh webbing. To allow for an extension or underhang in the lower leading portion of the net, the trawl was fished upside down with 50 floats on what would otherwise have been the footrope. Also used in a few early trials was a 40-foot square "sampling net" made of 5-inch-mesh webbing. Both trawls were fished with 14-fathom legs and $3\frac{1}{2}$ - by $6\frac{1}{2}$ -foot bracket doors. Trawl depth was determined, roughly, from a curve of vessel speed and tow warp

length that was obtained in gear trials, with a vessel riding over the towed net recording the depth of the trawl headrope at varying speeds and with varying lengths of wire out. (This technique has been described by Scharfe.)

Results from these early trials made it obvious that more elaborate gear and equipment was necessary. In particular, gear was needed that could be controlled accurately, and equipment was needed that would allow such control and give a constant reading on (1) net depth and (2) relation of the net to the bottom and to fish schools. The European gear and equipment described by Scharfe (1960) appeared to fulfill these requirements. Trials of comparable gear were witnessed in the Gulf of Mexico, and soon after, similar gear was obtained for use with the Delaware.

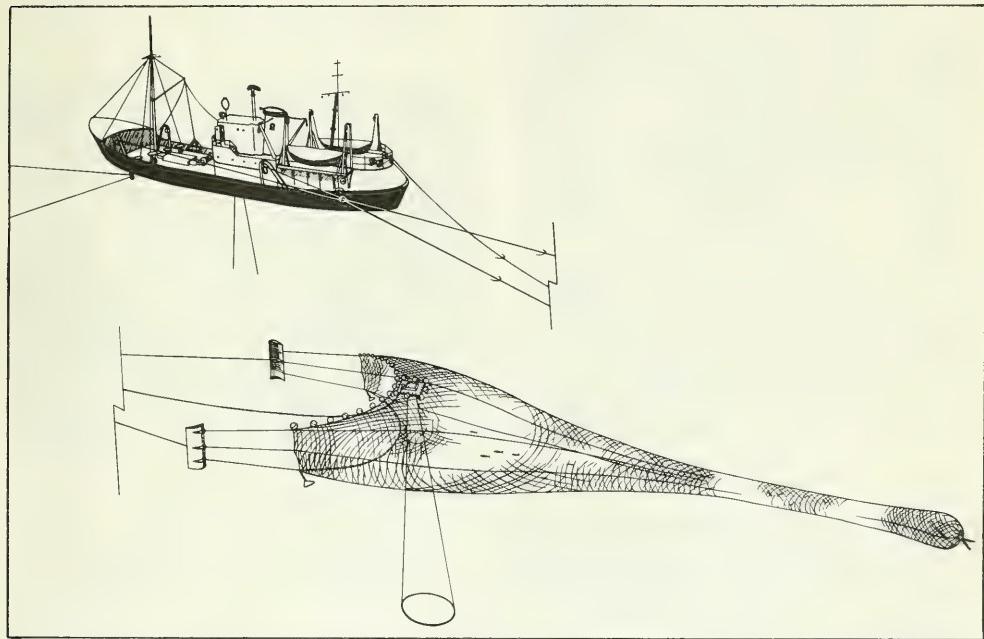


Fig. 1 - Diagram illustrating the midwater trawling system used during 1961 Delaware pelagic explorations. A transducer is mounted on the net and connected to the vessel through a net transducer cable. The approximate vertical and horizontal fields of the echo-ranging and echo-sounding equipment are shown.

The complete system (fig. 1) consists of the net, doors, legs, warp, depth-recorder, and 2 transducers--one mounted on the headrope of the net and connected to the vessel by means of a conductor cable and the other mounted in the vessel hull.

THE NET: The net is a modification of that described by Scharfe. It is built on a 2-seam design, of nylon webbing graded from 6-inch stretched measure in the mouth and wings to $1\frac{1}{4}$ -inches in the extension piece and cod end. The trawl is fitted with heavy nylon riblines and reinforcing lines. Headrope and footrope are both approximately 70 feet long. The measured distance between headrope and footrope under fishing conditions varied from 30 to 42 feet depending on the speed of the towing vessel.

OTTER BOARDS AND LEGS: "Suberkrub" otter boards, developed in Hamburg, Germany, were used exclusively in tests with the 2-seam trawl. The boards are of hydrofoil design and, as described by Scharfe, consist of cylinder segments. Those used measured $3\frac{1}{2}$ by 8 feet and weighed 480 pounds each. The boards fish with their longest dimension in a vertical plane (fig. 2), in contrast to conventional bottom trawl otter boards. They were connected to the trawl net by $\frac{3}{4}$ -inch combination manila-wire rope legs that were 15 fathoms long. Three legs were used on each door--one attached to the headrope, one to the footrope or groundline, and the third or middle leg to the side seam or "gore" of the trawl.

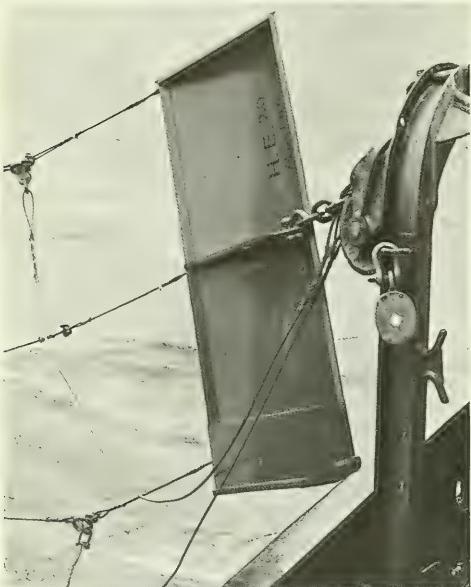


Fig. 2 - "Suberkrib"-type otter board outboard of the after-gallows of the Delaware. These boards are fished in the vertical position, as illustrated. With them rapid changes can be made in the depth of a midwater trawl by altering the r.p.m. of the vessel's engine. Three legs lead from the doors to the trawl.



Fig. 3 - Depressor used on each of the wing ends of midwater trawl. Depressors are cast of bronze and weigh approximately 45 pounds each.

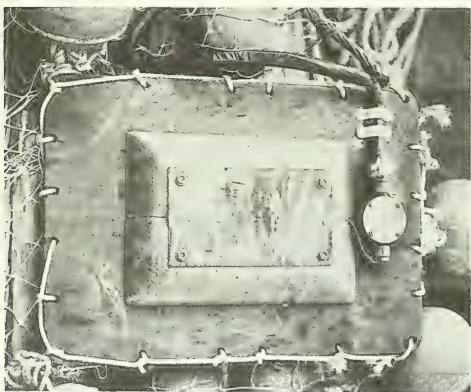


Fig. 4 - Depth transducer board mounted on the headrope of the midwater trawl. A conventional transducer is mounted in wood blocks at the center of the board. The junction box between transducer and cable is filled with silicone compound. The transducer cable is covered with a rubber hose at net to help reduce the effect of possible chafing.

WEIGHTS AND FLOATS: The footrope of the trawl was weighted with mackerel seine leads, which had a total weight of about 40 pounds. One 45-pound depressor (fig. 3) was attached to the end of each wing to help spread the gear. Fifty 8-inch-diameter aluminum floats were spaced evenly along the headrope.

ECHO SOUNDING AND RANGING EQUIPMENT: The most significant departures from conventional trawling gear and procedure were the addition and use of an unmodified standard depth-sounder transducer that was mounted on a board attached to the headrope of the net (fig. 4). A satisfactory watertight connection was made between the transducer and the $\frac{1}{2}$ -inch, rubber-covered, 2-conductor (No. 10) cable that led to the vessel by using a bronze junction box filled with silicone paste. The transducer system gave no serious trouble during the experiments.

The cable used measured over 200 fathoms in length and allowed the net to be operated at depths up to 50 or 60 fathoms. It was covered with a 30-foot section of rubber garden hose at the net end for protection against abrasion at the point where the transducer cable was seized to the headrope of the net. The cable was set and hauled back from a hydraulically-powered reel mounted on the stern of the Delaware (fig. 5).

A vessel-mounted depth-sounder and recorder designed specifically for fisheries work was used in conjunction with the net transducer arrangement. No modification was required to the recorder. By means of a simple switch in the pilothouse the recorder could be made to record either the net and hull transducers at the same time or the hull transducer only.

Simultaneous impulses to the net transducer and to a similar transducer mounted on the Delaware's hull yielded pilothouse recordings of water depths between net headrope and the bottom and vessel hull and bottom. Indications were also given as to the opening of the trawl (distance from the headrope to the footrope) and the presence or absence of fish schools, with-in or below the net (fig. 6).

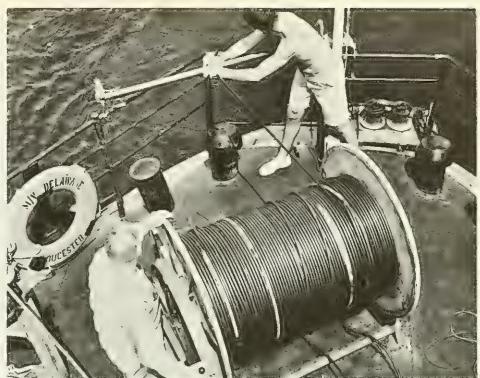


Fig. 5 - The hydraulically-powered cable reel mounted on stern of M/V Delaware. A 2-conductor (No. 10) rubber-covered electric cable is used to transmit power to the transducer on the trawl.

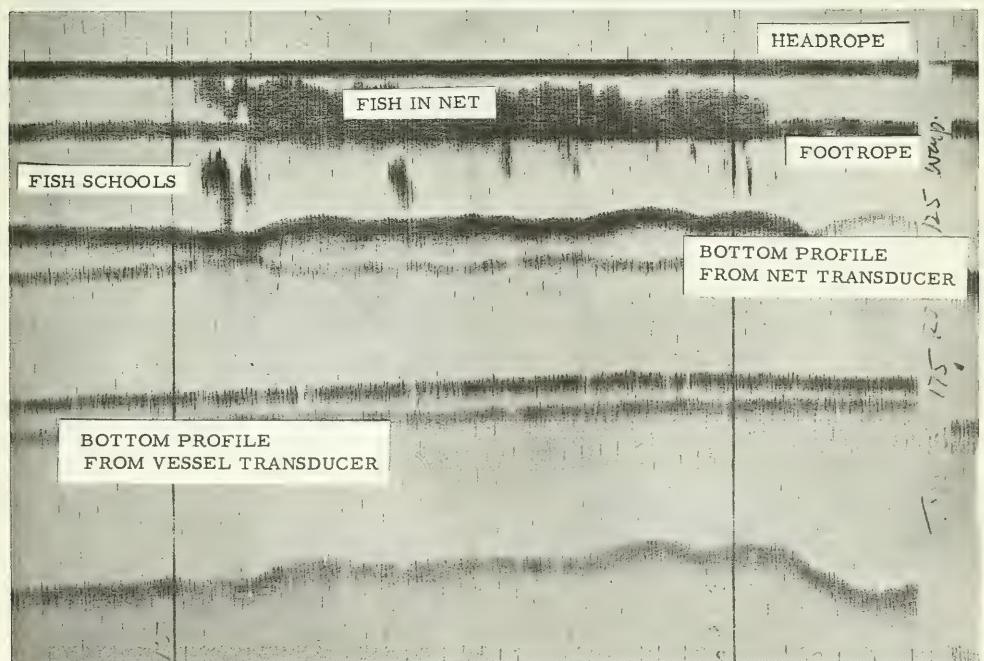


Fig. 6 - Recording showing the net over the bottom. Constant indications are given of the net's position in relation to the bottom, the presence of fish schools, and the size of the net opening (in this case about 40 feet between the headrope and footrope). This record was made along the northern edge of Georges Bank in June 1961 from the M/V Delaware.

In addition to vertical depth-sounding gear, echo-ranging or "ASDIC" equipment was also used to find concentrations of fish. This equipment operates in principle similar to that of the ASDIC equipment developed for submarine detection. Operational characteristics of the echo-ranging gear permit horizontal scanning of a zone up to 2,000 yards ahead or to either side of the vessel.

FISHING RESULTS

It became obvious early in the experiments that little in the way of catches could be anticipated unless the gear was set where positive indications of marine life appeared on the recorder or the echo-ranging screen. A need to relate the various echos received to actual catches also became obvious. The findings of Schaefers and Powell (1958), that certain types (species) of marine life display characteristic traces, seems verified, but success in associating these traces with actual organisms making them requires considerable interpretation.

Although 30 species of fish and invertebrates (table 2) were represented in the small number of midwater catches made, only 5 species were represented in catches five or more times, and just 4 species were taken in amounts of over 100 pounds per one-hour tow. Nevertheless, when fair to good signs of fish were indicated on the recording equipment, the gear used was usually effective.

Table 2 - List of Species Taken in Midwater Trawl, M/V Delaware, 1961		
Species	Scientific Name	Number of Tows Represented
Fishes:		
Atlantic herring	<i>Clupea harengus</i>	13
White hake (silver hake)	<i>Merluccius bilinearis</i>	12
Spiny dogfish	<i>Squalus acanthias</i>	7
American mackerel	<i>Scomber scombrus</i>	5
Butterfish	<i>Poronotus triacanthus</i>	5
Lumpfish	<i>Cyclopterus lumpus</i>	3
Blueback herring	<i>Alosa aestivalis</i>	1
Longhorn sculpin	<i>Mycoxenophulus octodecemspinosis</i>	1
Scup	<i>Sciaenops ocellatus</i>	1
Atlantic wolffish	<i>Anarhichas lupus</i>	1
Goosefish	<i>Lophius americanus</i>	1
Haddock	<i>Melanogrammus aeglefinus</i>	1
Northern puffer	<i>Sphoeroides maculatus</i>	1
Snipe eel	<i>Nemichthys scolopaceus</i>	1
Viperfish	<i>Cymothodus sloani</i>	1
Lanternfish	<i>Mycopodus macrourus</i>	1
"	<i>Notoscopelus sp.</i>	1
1/	<i>Hygophum sp.</i>	1
1/	<i>Pseudoscopelus altipinnis</i>	1
1/	<i>Chlorophthalmus agassizii</i>	1
1/	<i>Nessorhamphus ingolfianus</i>	1
1/	<i>Ceratoscopelus maderensis</i>	1
Arthropoda:		
Euphausiids	<i>Nyctiphanes norvegica</i>	4
Rhoda inermis	<i>Rhoda inermis</i>	1
Amphipod	<i>Euthemisto compressa</i>	1
Shrimp	<i>Pandalus borealis</i>	1
Ctenophora:		
Comb jelly	<i>Pleurobrachia sp.</i>	1
Annulata		
Sea worm	<i>Glycera sp.</i>	1
Cephalopoda:		
Sea arrow	<i>Ommastrephes illicibrosa</i>	1
Squid	<i>Calliteuthis reversa</i>	1
Octopus	<i>Alioposopus mollis</i>	1

1/No known common name.

ATLANTIC HERRING: Herring were taken in 13 of the tows completed, in amounts up to 4,500 pounds per one-hour tow (fig. 7). During cruise 61-8, schools of small herring were abundant along the northern edge of Georges Bank. After several trial tows, good catches of herring could be made consistently. Most of the herring schools were in 25 to 35 fathoms of water. School depth (observed with echo-sounding gear and visually) varied from the surface to the bottom with time of day, state of tide, and other factors (fig. 8).

Of particular interest were certain of the observations made possible by the presence of a transducer on the net. On several occasions fish were sonically determined to be at a certain depth off the bottom when the Delaware passed over them. By the time the net reached the schools, the fish had sounded—in some cases as much as 10 fathoms. Movements of these fish must be anticipated and the net must be fished at the depth toward which the her-



Fig. 7 - Approximately 2½ tons of midwater-trawl-caught herring aboard the Delaware. Catch was made in June 1961 along the northern edge of Georges Bank.

ring move. Herring were also observed swimming in the mouth of the trawl; when the speed of the vessel was increased, these fish were "flushed" into the cod end.

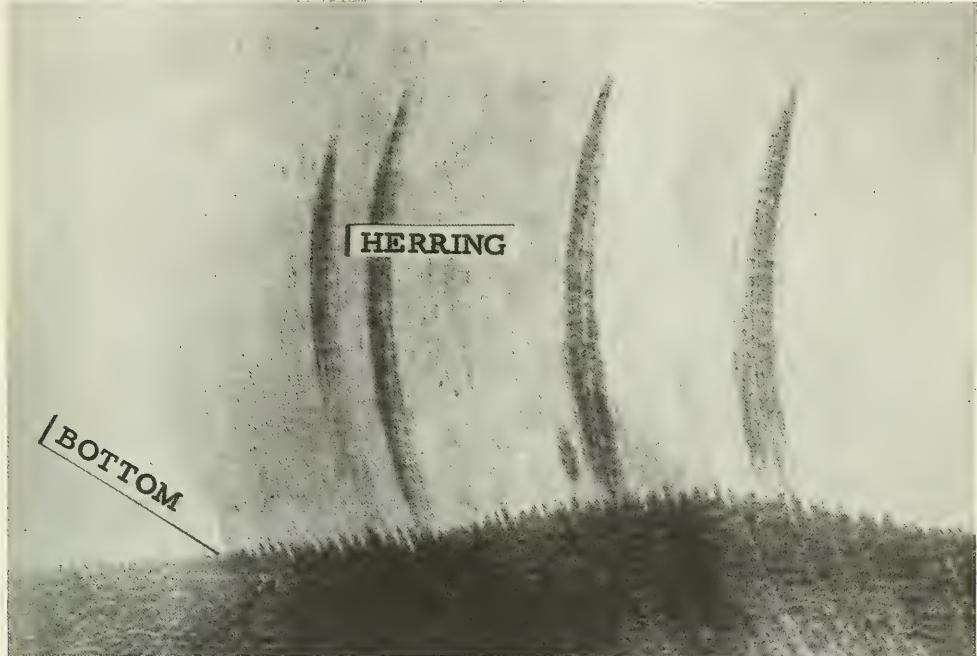


Fig. 8 - Tracings indicating herring schools along northern edge of Georges Bank, June 1961. Depth of bottom, 32 fathoms. Fish schools extended to about 15 fathoms over the bottom.

WHITING (SILVER HAKE): Although whiting were never taken in great numbers (the best individual catch rate was only about 30 pounds per hour), they were present in 11 tows, and on all 1961 pelagic fishing cruises. Commercial fishermen have noted that the whiting sometimes tend to rise off the bottom and enter mid-depths at night. This was observed during Cruise 61-11. The Delaware was allowed to drift among the commercial whiting vessels from late afternoon on July 10 until morning on July 11 while depth-sounder recordings were made. Two one-hour midwater tows were made to sample the schools indicated on the recorder (fig. 9). The resulting catches yielded only 15 to 20 pounds of small 5- to 10-inch whiting. Although the whiting were present in some numbers in the mid-depths, they did not appear to be heavily concentrated at that time.



Fig. 9A - Fish starting to rise off bottom in early evening on the western edge of Georges Bank in about 43 fathoms. Recording was made while the Delaware was in the midst of the fishing fleet as whiting were being taken.

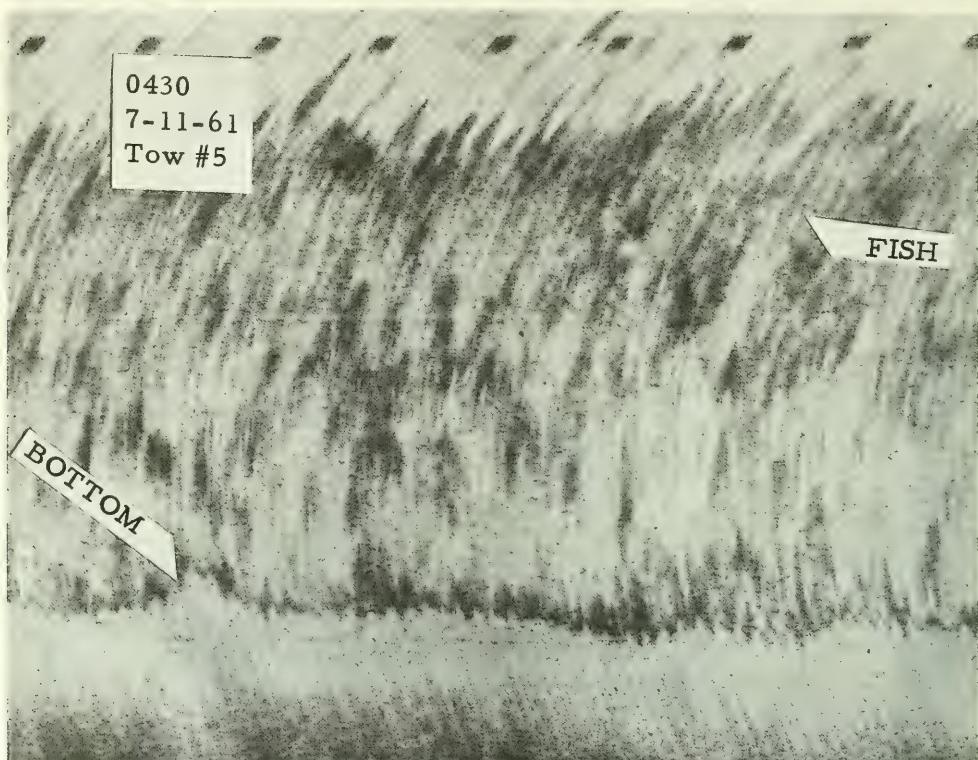


Fig. 9B - Depth sounder tracings made during midwater trawl tow. The principal catch consisted of whiting.

SPINY DOGFISH: This species, presently regarded as a pest by New England fishermen, was taken on seven different occasions. Had dogfish been the object of trawling, little trouble would have been experienced in capturing almost unlimited numbers. Dogfish were especially common in Massachusetts Bay from June through October 1961 (fig. 10). Aside from the existing lack of commercial interest in them, dogfish are avoided because of the damage that heavy catches of dogfish can inflict on a trawl net, particularly on a light nylon midwater trawl.

OTHER SPECIES: Mackerel as large as 10 inches long were taken on five occasions. Mackerel as large as 10 inches long were taken on five occasions. Best catch was roughly 100 pounds. Butterfish were present in 5 tows, but only in small numbers. Other species represented in catches and the frequency of their occurrence are listed in table 2. One catch of 500 pounds of euphausiids (krill) resulted from a short (less than one-hour) tow off Mt. Desert Rock, Maine (fig. 11).

DISCUSSION

Accelerated worldwide interest in the ability to harvest fish with midwater trawl gear has led to new developments which make such harvesting more feasible. To date, the most obvious successes have been in the capture of various species of herring, certain other fishes

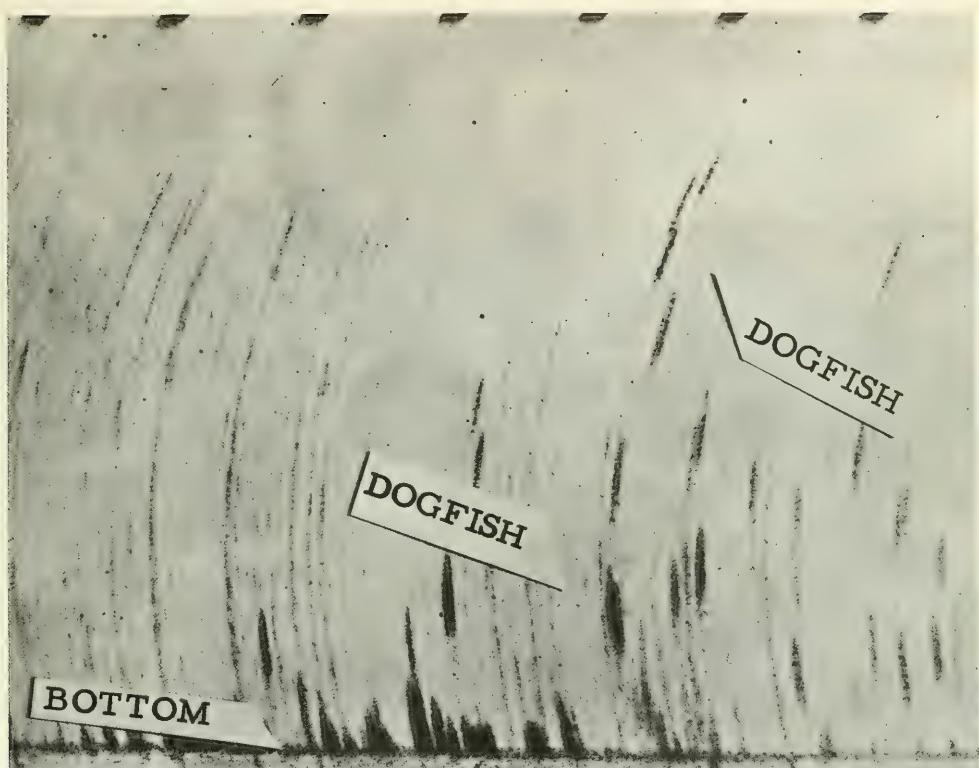


Fig. 10 - Typical indications of dogfish (*Squalus acanthias*) in the Massachusetts Bay during the summer of 1961. A short tow (less than one-hour long) yielded 700 pounds of dogfish.

related to herring, mackerel, and some of the hake. The difficulty in gaining capacity loads of fish in short periods has become a factor contributing to the present unstable economic condition of the New England trawl fishery. The midwater trawling technique offers the possibility of increasing harvests in existing fisheries under some natural circumstances. Fish that leave the bottom during part of the day might possibly be fished profitably with midwater trawls. Such fishes include ocean perch (redfish), whiting, cod, haddock, pollock, scup, and butterfish. Other fish stocks in unknown supply, presently of no particular commercial interest, or not fully used, could be caught with midwater gear. Included here are, particularly, the herring, pilchard, shad, menhaden, and their close relatives, and the mackerel, spiny dogfish, squid, and possibly even tuna.

The limited amount of work accomplished so far indicates that the type of midwater trawl gear described has great potential usefulness in midwater trawl fisheries. Among the advantages are: (1) the ability to keep constant watch over the depth of the net and (2) the ability to adjust the depth of the net to compensate for changes in fishing depth due to wind, current, or tide changes during a tow.

Observations made during the 1961 experiments indicate that changes in direction or speed of wind, current, or tide may affect the depth at which the trawl fishes. With the transducer-equipped net, such effect can be readily detected. Depth corrections can then be made,

easily, by increasing the vessel speed. With the "suberkrub" doors used during the experiments, it was demonstrated that a slight change in r.p.m. would produce a rather marked change in fishing depth of the net; for example, in one instance, the net was raised 10 fathoms merely by increasing vessel r.p.m. from 160 to 180.

There are also disadvantages in the gear system used. Some of these may be worked out in the near future. The need for a third wire to the net transducer is, perhaps, one of the greatest disadvantages. Handling the third wire during setting and hauling calls for extra care on the part of the captain and crew and imposes restrictions on the ability to fish in heavy weather.

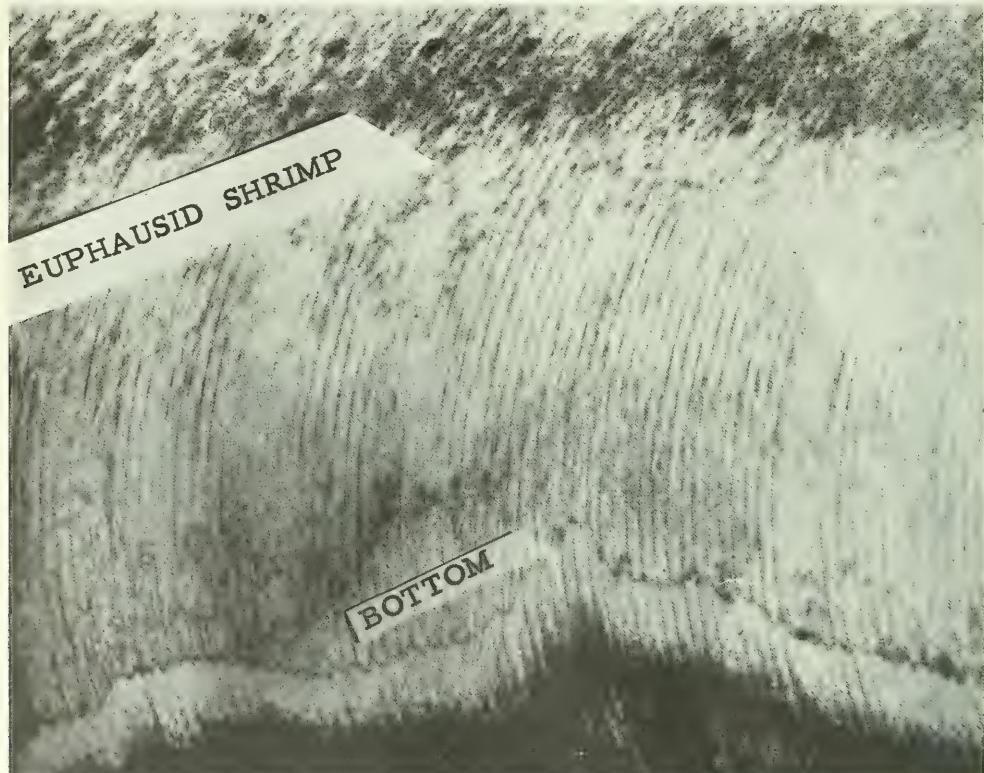


Fig. 11 - Depth recording made off Mt. Desert Rock (Maine) in September 1961. A midwater trawl tow, made coincident with the recording, yielded 500 pounds of euphausiids and 15 pounds of small brit-size herring in less than one hour of fishing time.

Finally, development of an effective gear system, alone, does not assure development of a fishery. Particular attention in the future must be given to finding concentrations of marine animals and sampling them effectively. Supplementary gear may prove of value here, i.e., lift nets, long lines, gill nets, and lights. Detailed seasonal coverage must be obtained. Advanced concepts should also receive attention--among them electrical fields and their applications to harvesting midwater resources.

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PICKS

A pick is a two- or three-pronged instrument set in a short wooden handle. It is used in gathering of hardshell clams and oysters.

Another instrument is known as a mussel pick. The mussel pick is a rod flattened at one end. It is used in gathering fresh-water mussels by inserting the rod between the shell of the mussel. A device similar to the mussel pick is sometimes used in taking oysters.

Note: Excerpt from Circular 109, Commercial Fishing, Gear of the United States, for sale from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., single copy, 40 cents.



Clam pick.

THE STOCKFISH AND SPINY LOBSTER FISHERIES OF SOUTH AFRICA

By Albert C. Jensen*

ABSTRACT

The stockfish (*Merluccius capensis*) is the most important species in the Republic of South Africa's trawl fishery. Recent annual stockfish landings were on the order of 169 million pounds. The fish are caught by large otter trawlers with the bulk of the landings going to the fresh fish market. When the stockfish are dressed at sea, the entrails are saved for the oil and meal plants ashore and the heads are saved for bait in the spiny lobster fishery. During the unloading operations, great care is exercised to insure the highest quality product possible.

The fishery for the South African spiny or rock lobster (*Jasus lalandii*) is carried out with two-man dinghies tended by wooden-hulled vessels 50 to 60 feet long. The lobsters are caught in a conical, twine pot baited with stockfish heads, fish frames, or whole fish. Only the meaty tails of the spiny lobster are used. Over 90 percent of South Africa's production of 7 million pounds of spiny lobster tails is exported to the United States.

INTRODUCTION

During October-December 1961, I was an observer for the U. S. Bureau of Commercial Fisheries aboard a U. S. Navy ship operating off the West Coast of Africa. As part of the cruise the ship visited several coastal cities including Capetown, Republic of South Africa. Thus, I was able to observe the shoreside operations of two of South Africa's most important marine fisheries.

STOCKFISH FISHERY

The otter-trawl fleet of the Republic of South Africa includes about 62 vessels, slightly more than half of which are based at Capetown. Although some 14 species of bony fishes are

included in the catches of the trawlers, the principal effort is directed toward the stockfish (*Merluccius capensis*). Recent annual stockfish landings were in excess of 169 million pounds. In second place for the landings by the trawlers was the maas-banker (*Trachurus trachurus*) with nearly 7 million pounds, and in third place was kingklip (*Genypterus capensis*) with slightly less than 3 million pounds.

The stockfish closely resembles whiting or silver hake (*Merluccius bilinearis*), except that most of the fish I saw unloaded were larger than the usual commercial sizes of whiting in the United States. Many stockfish seemed to be between 80 and 85 centimeters (31.5-33.5 inches) long with the heads on. Kingklip resembles a red hake (*Urophycis*



Fig. 1 - A large otter trawler at the dock in Capetown, Republic of South Africa. The vessel is typical of the fleet that fishes for stockfish.

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chuss) both in shape and color, but grows to larger size; some of the kingklip I examined ranged from 30 to 80 centimeters (11.8-31.5 inches) in length. It is eagerly sought for the fresh-fish trade and commands a good price in the market.

FISHING VESSELS: The vessels I saw at Capetown were large, steel-hulled, about 150 feet long and resembled the large otter trawlers that fish out of Boston. They are powered by coal-fired reciprocating steam engines (since coal is relatively cheap in South Africa), although recently some thought has been given toward introducing Diesel-powered trawlers. The vessels have the conventional arrangements of winches, etc., but with gallows frames on the starboard side only. The crew numbers between 20 and 25 men, including 12 deckhands (fishermen), captain, mate, boatswain, one or more fishermen apprentices, cook and engine-room personnel.

FISHING OPERATIONS: The Continental Shelf around South Africa is quite narrow, thus relatively little time is spent steaming to and from the grounds located about 50 miles offshore, in about 300 fathoms. The vessels spend $5\frac{1}{2}$ days at sea, and fish during daylight hours only since the stockfish are off the bottom at night and thus unavailable to otter-trawl gear. About 60 to 70 metric tons of fish constitutes a good trip.



Fig. 2 - Unloading the catch of stockfish and other species. The wicker baskets are filled with fish by the hold-man and hoisted to the deck.



Fig. 3 - The filled baskets of stockfish and other species caught by the trawlers are placed on a mechanical conveyor that raises them to the pier where the fish are sorted and boxed.

The fishing operations are carried out generally about the same as they are aboard United States trawlers. The fish are gutted, beheaded, washed, and put below in the hold in pens with liberal quantities of ice. The stockfish heads also are iced below, while the liver and entrails are saved for the meal and oil plants ashore. Fish ovaries in a ripening condition ("spawn") are saved for the food market, and any octopus or squid are saved for the fish-bait market. (Incidentally, a favorite mug-up treat for the crew is a dish of boiled stock-fish tongues.)

UNLOADING AND PROCESSING: The day I visited the fish pier six trawlers were tied up, some ready to unload. In a good day, 200 tons of fish will be taken out, but the biggest

day is on Sunday when about 400 tons are unloaded. The unloading process is quite interesting, particularly to someone who has witnessed the treatment, including pitchforks, that is accorded fish at our New England fish piers.

Aboard the vessel, the hold-man shovels the fish from the pens into wicker baskets about 3 feet long, $1\frac{1}{2}$ feet wide, and 1 foot deep. The shovel used is very much like the perforated ice shovel used aboard our trawlers. Great care is exercised in removing the fish from the pens. Any bruised or damaged fish are rejected by the fresh-fish market, and must go to be

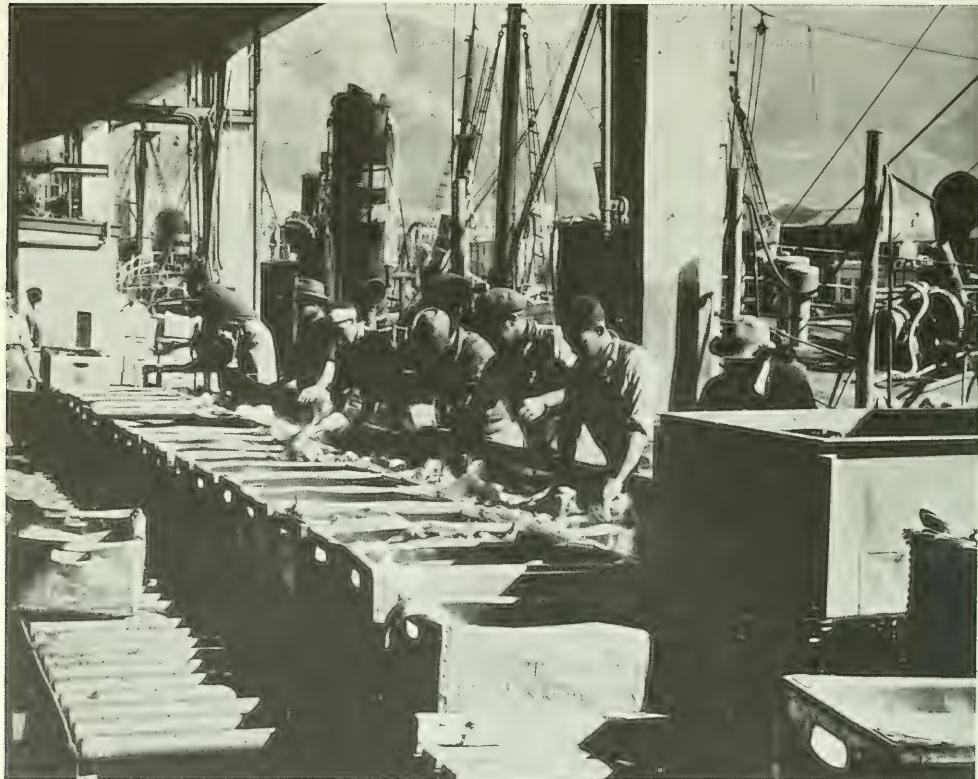


Fig. 4 - Sorting the stockfish and other species caught by the trawlers. The fish move on a conveyor belt and the men separate them by species. Any damaged fish are removed, the rest are packed in aluminum kits and shipped by truck or rail to market.

salted and dried, or smoked. Ice is put in the wicker baskets to insure the continued freshness of the fish during the unloading operations. This is especially important with the stockfish which, like our whiting, tends to soften in a comparatively short time.

The filled wicker baskets are hoisted out of the hold to the deck where they are placed on a conveyer belt that raises them to the fish pier. At the top of the conveyer a worker dumps the basket into a hopper that separates the fish and ice. The ice drops into a separate trough while the fish move onto a horizontal conveyer belt that passes in front of a line of men. The men sort out the species and also reject any damaged fish. The fish are then placed in aluminum fish boxes, each holding about 100 pounds, with plenty of ice. The boxes go immedi-

ately into waiting refrigerated trucks or railroad cars and are transported directly to retail markets in Capetown and other parts of South Africa. In season, spawn is cello-wrapped for the retail markets. Throughout all of the fish handling operations the emphasis is on securing the highest quality product possible.



Fig. 5 - Piles of stockfish heads. The heads are packed in aluminum kins and taken to one of three markets. Some are smoked and sold for human food in other parts of Africa, some are used for bait in the spiny lobster fishery, and the rest go for reduction.

are sold to the spiny lobster fishery for bait; the smaller heads are smoked and sold as food in other African nations. Ghana, for example, is an important customer for smoked stockfish heads, and they are also popular in the interior sections of Africa. Any heads not used in either of these outlets go to the meal plant. Some of the slightly bruised or damaged stockfish are smoked and sold in the retail markets as "haddock." Stockfish (not suitable for the fresh fish or the haddock trade), maasbunker, and pilchards are salted and dried, and shipped as "minefish" to feed the workers in the South African gold and diamond mines.

SPINY LOBSTER FISHERY

The fishery for "kreef"¹ or spiny lobster (*Jasus lalandii*) began on a limited scale in South Africa before the beginning of the 20th Century but was not established on a sound economic basis until after World War II. Today, the annual production of frozen spiny lobster tails is about 7 million pounds.



Fig. 7 - Part of the Capetown fleet engaged in the South African spiny or rock lobster fishery.

¹Afrikaans word for crayfish.



Fig. 6 - Boxes of stockfish heads ready to be loaded aboard a spiny lobster vessel for bait.

The stockfish heads are unloaded and separated according to size. The smaller heads are smoked and sold as food. Any heads not used in either of these outlets go to the meal plant. Some of the slightly bruised or damaged stockfish are smoked and sold in the retail markets as "haddock." Stockfish (not suitable for the fresh fish or the haddock trade), maasbunker, and pilchards are salted and dried, and shipped as "minefish" to feed the workers in the South African gold and diamond mines.



Fig. 8 - A spiny lobster vessel with a few crew members relaxing around one of the dinghies used to tend the lobster pots. The pots, with their buoy lines and the strings of cork floats that form the buoys, are draped over the boom.

VESSELS AND FISHING OPERATIONS: The spiny lobster fleet that fishes out of Cape-town is composed of wooden vessels, 50 to 60 feet long, that resemble New England draggers in profile. Each vessel carries 4 to 6 wooden dinghies and a crew of 12 to 16 men. They fish days only, 30 to 40 miles offshore in about 15 fathoms. Some of the vessels stay out overnight, fish the morning of the second day, and return to unload their catch in the afternoon.

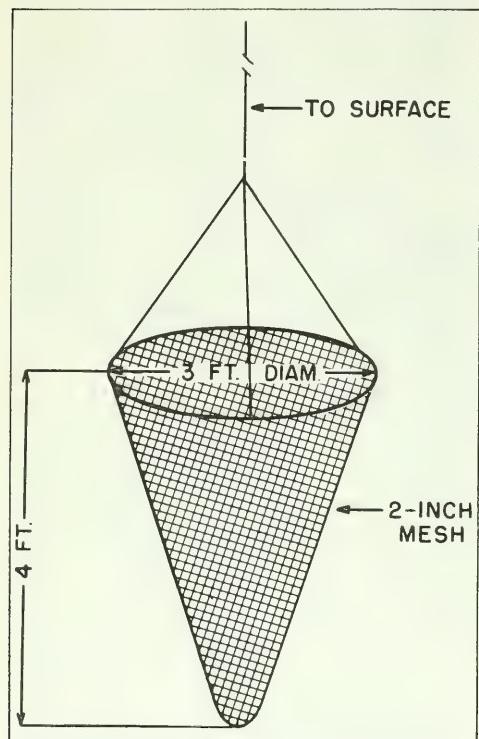


Fig. 9 - Diagram showing the shape and size of the spiny lobster pot used by the Capetown fleet.

The gear used is a conical, twine pot, to which is attached a length of buoy line and a marker buoy. When the boat reaches the fishing ground the dinghies, each manned by two men, are put over the side. Each dinghy fishes eight pots. The pots are baited with stock-fish heads, pilchards, maasbankers, or fish frames, and set on the bottom. From time to time they are lifted and inspected, and any lobsters in the pots are removed and placed in a bag hung over the side of the dinghy.

UNLOADING AND PROCESSING: At the end of the fishing period the catch from each dinghy is placed on ice in the hold of the vessel; about 100 pounds of lobsters constitutes a

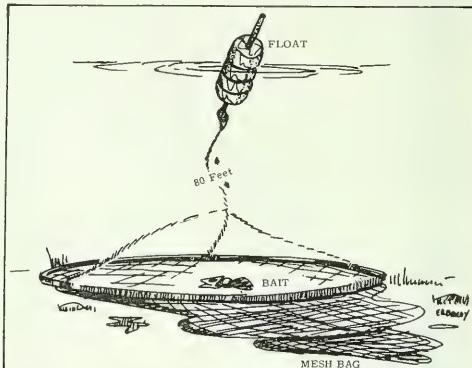


Fig. 10 - Sketch showing the way the pot rests on the bottom when it is fishing. Stockfish heads or other bait are tied to the mesh and the pot is raised periodically to remove any lobsters that may have entered.

fair trip. At the wharf, company-employed lumpers unload the trip of iced, but still living, lobsters. A man in the hold loads the lobsters into wicker baskets that are passed up by hand to the wharf and dumped into hand carts. At this point in the operation, inspectors hired by the fishing industry association check the lobsters for minimum size.

The filled carts are then wheeled into a long, open concrete shed where workers separate the tails from the body. The tails are graded by weight, packed in cartons holding about 20 pounds, and frozen, with the bulk of the production (more than 90 percent) going to the United States. The remainder of the lobster body goes to the meal plant.



TRENDS AND DEVELOPMENTS

Alaska

COURT RULING ALLOWS ALASKA TO TAX FREEZERSHIPS OPERATING IN BRISTOL BAY:

An Alaska Court ruling probably will subject freezerships operating in Bristol Bay to an Alaska license tax even if the freezerships take on fish at sea from catcher vessels. According to the Seattle Post-Intelligencer, Sept. 6, 1962, the First District Superior Court of Alaska ruled on Sept. 5, 1962, that the territorial waters of Alaska in Bristol Bay are those waters within a line from Cape Newenham on the north side of Bristol Bay to Cape Menshikof on the Alaska Peninsula. A line from Cape Newenham to Cape Menshikof would pass at least 50 miles southwest of Nushagak Bay and would enclose all important salmon-fishing grounds in Bristol Bay.

The Alaska legislature imposed a license tax in 1951 on freezerships and floating cold storages equal to 4 percent of the value of the fishery products frozen by the vessel. Most freezerships operating in Bristol Bay buy salmon for canneries in the State of Washington. They move into Bristol Bay during the salmon season, take on a cargo of fish for freezing, and then return to their home ports where the fish are processed.



Alaska Fisheries Exploration and Gear Research

STOCKS OF KING CRABS LOCATED NEAR KODIAK:

M/V "Yaquina" Cruise 62-1 (July 7-August 19, 1962): Possible commercially-valuable stocks of king crabs were located as a result of exploratory fishing conducted by the U. S. Bureau of Commercial Fisheries chartered fishing vessel Yaquina, during a cruise in the vicinity of Kodiak.

Combined trawl and king crab pot sampling was undertaken by the Yaquina on a six weeks exploration of potential king crab fishing grounds in the Portlock Bank area east of Kodiak Island.



Fig. 1 - The 75-foot Yaquina chartered by the Bureau of Commercial Fisheries to conduct exploratory fishing surveys in Alaskan waters during 1962.

Depths from 42 to 120 fathoms were surveyed for crabs in a series of 61 one-hour tows with a standard 400-mesh eastern otter trawl. The trawled zones found most productive of king crabs were then fished approximately 24 hours each with units of 15 standard, 6-foot, round king crab pots equipped with vertical tunnel openings. Pot sampling was accomplished at 16 locations. Crabs were found on nearly all of 77 stations, representing preliminary examination of an area of about 5,500 square miles.

Marketable crabs in commercial quantities (more than 30 crabs per pot) were found at depths from 46 to 82 fathoms in a submarine gully extending about 40 miles southeast from the vicinity of Cape Chiniak. The best catches here were made along the northeast side of the gully, increasing in quality and abundance proceeding seaward and into deeper water. The average catch per pot of 48 pot sets in the 70-

to 82-fathom zone was 24 marketable male crabs averaging about 10 pounds each; the best catch by a single pot in Chiniak Gully was 58 such male crabs from 73 fathoms.

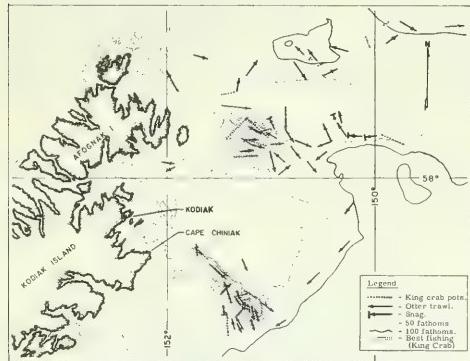


Fig. 2 - Grounds fished by M/V Yaquina cruise 62-1 (July 7-August 19, 1962). Vessel operates from Juneau, Alaska.

A second area of potential value to the commercial fishery during the summer period lies in a broad submarine gully at about 20 miles due east of Marmot Island. In this area 46 pots caught an average of 20 marketable crabs each, within a depth range of 59 to 94 fathoms. The best catch from a single pot here was a catch of 64 crabs. This pot was of a modified design and was fished in a depth of 92 fathoms.

Trawl catches also yielded information on other potentially-important species. Pacific ocean perch were frequently taken at rates ranging from 1,000 to 5,500 pounds per hour. Also in abundance were rock sole, caught in amounts up to 1,800 pounds during a one-hour tow in the Chiniak Gully area at depths from 42 to 60 fathoms.

Incidental to the exploratory operations, was the tagging and releasing of king crabs and halibut in cooperation with biologists of the Bureau and the International Pacific Halibut Commission. Specimens of marine life were preserved for later study by cooperating scientists.

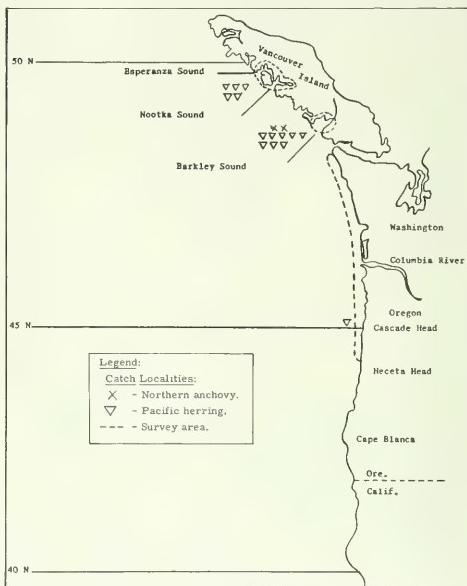
The chart shows the grounds fished and shaded areas where commercial fishing of king crabs might be possible. Three otter-trawl drags and one pot station near $58^{\circ}35'$ north latitude, $148^{\circ}30'$ west longitude, are not shown. These stations did not yield commercial quantities of crabs.



California

PELAGIC FISH POPULATION SURVEY CONTINUED:

M/V "Alaska" Cruise 62-A-3 (July 16-August 14, 1962): The three objectives of this cruise were: (1) to determine if there were any traces of the sardine population that formerly migrated to the Pacific Northwest in summer, (2) catch live sardines for sub-population studies, and (3) collect other pelagic species for density and distribution studies. The sounds of western Vancouver Island and the coastal waters of Washington, Oregon, and central California were the areas



Area of operations of M/V Alaska during cruise 62-A-3.

explored by the California Department of Fish and Game research vessel Alaska during cruise 62-A-3.

VANCOUVER ISLAND: No sardines were caught or observed off the Island. Night-light stations using a blanket net and visual scouting during both day and night failed to locate fish. Several fishermen reported seeing a few individual sardines in 1958, but most fishermen interviewed on this trip hadn't seen any for many years.

Pacific herring were abundant in the sounds and inlets. They were caught on 72 percent of the night-light stations and ranged from 60 to 200 millimeter (2.4 to 8.0 inches) standard length. The blanket net appeared to be an excellent sampling tool for herring in this area. Up to 7,000 herring were taken in single sets, with catches averaging about 1,000 fish. Excellent sea conditions and favorable fish behavior made the net effective.

Large northern anchovies ranging from 142 to 165 millimeter (5.7-6.6 inches) standard length, were caught in Barkley Sound. Young silver salmon 115 to 382 millimeter (4.6-15.3 inches) standard length were caught on 39 percent of the light stations. They were feeding on polychaete worms and small herring which were attracted to the light. Up to a half dozen were observed at once, but usually not more than two were caught in the net.

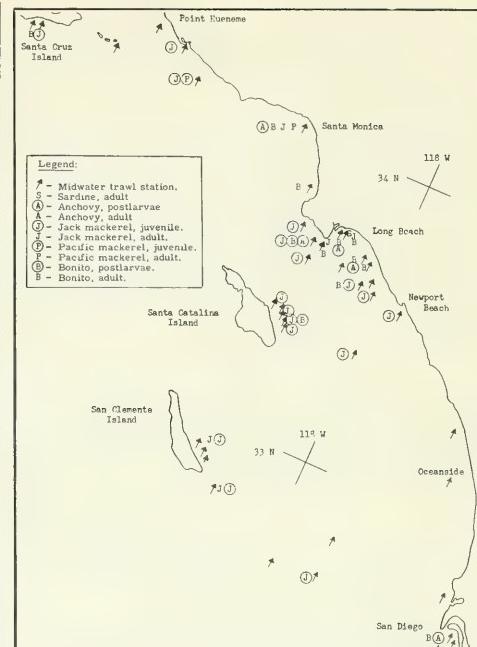
WASHINGTON-OREGON-CENTRAL CALIFORNIA: No sardines were caught or observed in these areas. Light stations were much less productive than those off Vancouver Island. One sample of Pacific herring was caught by blanket net and a school group of large adults was observed off Cascade Head, Oregon. A single albacore tuna was caught 65 miles west of the Columbia River.

Catch Summary of Cruise 62-A-3 by M/V Alaska				
Area	No. of Stations	Samples		
		Herring	Anchovy	Young Salmon
Vancouver Island	18	13	2	7
Washington-Oregon	20	1	0	0
Central California	3	0	0	0
Totals	41	14	2	7

Except for central California, fair weather prevailed over the areas surveyed during the cruise. Sea-surface temperatures ranged from 67.1° F. (19.5° C.) at Esperanza Sound to 52.2° F. (11.2° C.) off Cape San Martin. Temperatures in the sounds of Vancouver Island dropped sharply within a few feet of the surface.

* * * * *

M/V "Alaska" Cruise 62-A-4 (August 22-September 7, 1962): To evaluate a midwater trawl as a tool for sampling the pelagic environment in coastal waters (including those around the Channel Islands between Point Hueneme and San Diego) and to develop techniques for handling the gear on future sea surveys were the principal objectives of this cruise by the California Department of Fish and Game research vessel Alaska.



Area of operations of M/V Alaska during cruise 62-A-4.

The midwater trawl is constructed with a square mouth opening of 63 feet on each side. The over-all length is 160 feet and the mouth, breast, and lead lines are 91 feet long. The wings and body are made from 4½-inch mesh webbing; the intermediate section is made from 3-, 2-, and 1-inch mesh, and the cod end, from ½-inch mesh. The net is 1,200 meshes in circumference behind the wings. All netting and lines are made of nylon.

The net is held open by quarter doors attached to the four corners of the net. Each quarter door is 32 by 48 inches, and is constructed of 1¼-inch marine plywood. The quarter doors are bridled with 45 fathoms of 5/16-inch cable. Two regular trawl doors are attached at the apex of the bridles, and provide the downward pull to sink the net to the desired fishing depth.

The net operated quite well during the cruise and only minor adjustments were necessary to produce the maximum attainable spread. The net spread to an opening of 35 to 40 feet, with all doors stable. That spread

was not as great as hoped for, because the wing meshes were not opening properly. The wings are to be redesigned in an attempt to increase the net opening.

The twin-engine Beechcraft owned by the California Fish and Game Department was used during the last two days of the cruise to locate fish schools, and to guide the Alaska over them. Fog limited those operations to the afternoons during both days. The plane used in conjunction with the cruise spotted several small schools, but the lack of maneuverability of the net and the speed of the schools prevented success in catching any fish.

A total of 39 tows was made under a variety of conditions. Most of the tows were made at or near the surface. A few tows were made at depths up to 100 fathoms. Some tows were made in clear offshore waters, others in the shallow, turbid water near the coast.

The amount of fish caught in a haul varied from nothing to 3 tons of fish. On the average, catches were small, with a few dozen fish being the general rule.

Adult bonito were caught in 10 tows, in amounts ranging from 2 to 118 fish. Young jack mackerel were netted in 17 tows. Adult jack mackerel were caught in 5 tows, including 1 tow which yielded about 50 pounds (1,500 fish) of mixed adult and young fish. Adult and young Pacific mackerel were each taken in another tow. A single adult sardine was found in a mixed haul of jack mackerel and jack smelt from Los Angeles harbor. Post larval anchovies were found hung up in the net meshes on 5 tows, and about 3 tons of adult anchovies were caught on 1 tow.

A number of less important species were caught frequently. Bat rays were caught in tows, molas in 5, and medusafish in 6. Two samples of jack smelt yielded about 175 fish each, and young Pacific hake were caught in 2 tows.

Invertebrates comprised a prominent part of the catch on this cruise. About 500 pounds of large jellyfish were collected on several tows, and large numbers of salps were frequently found in the cod end and hung up in the net mesh. Small amounts of several species of squid were caught occasionally.

Preliminary tows made on the cruise showed considerable promise for the midwater trawl as a sampling tool. The ability of the net to sample fast-moving bonito, its ability to catch a large sample of a dense concentration of anchovies, and its ability to collect consistent samples of young jack mackerel all demonstrated its effectiveness as a sampling tool. There are plans to test the net further during the fall months of 1962 so as to compare catches made using a blanket net with those made using the midwater trawl.

* * * * *

Airplane Spotting Flight 62-8-Pelagic Fish (August 7-9, 1962): To determine the distribution and abundance of pelagic schools, the inshore area from the United States-Mexican Border to Bolinas Bay was surveyed from the air by the California Department of Fish and Game's Cessna "182" 9042T.

The first day's survey covered the area from Los Angeles Harbor to Point Conception. Seven anchovy schools were sighted below Point Dume, and in the area between Port Hueneme and Gaviota, there were 173 anchovy schools. So far this year the schools in that area, have been for the most part, between 1 and 2 miles offshore. On this spotting flight, the schools were very close (200 to 300 feet) to shore, and some were strung out along shore for about one-half mile. Where kelp beds were present, which is common in that area, the schools were between the inner edge of the kelp and shore.

On the second day of the flight, the area from Bolinas Bay to Point Sal was surveyed. The aircraft started at Moss Landing and flew along the coast to Bolinas Bay. Between the Pajaro River and Bolinas Bay, 519 schools of anchovies were counted. Between Half Moon Bay and the Pajaro River, 437 schools were counted, and 78 between Half Moon Bay and Bolinas Bay. What was believed to be four anchovy schools were sighted off Angel Island in San Francisco Bay. Red tide was prevalent in Monterey Bay, and was especially heavy from Santa Cruz to Moss Landing. There were numerous anchovy schools in the same area. It seemed that if they were not in the red tide, they were beneath it. Eighty-eight schools were counted from Pfieffer Point to Cape San Martin. From San Simeon to Pismo Beach, 272 anchovy schools were observed--189 of them in Estero Bay. In the cove above Gamboa Point,

four purse seiners were reported to be looking for sardines. One boat was making a set but there were no fish in the net.

On the last day of the survey, the area from Redondo Beach to the United States-Mexican Border was covered. Eight anchovy schools were noted off Rock Point and one at Los Angeles Harbor. Two schools were seen off Bolsa Chica (Tin Can) Beach and six off Newport Pier. Off Capistrano Pier, 13 schools appeared to be mixed in with the red tide. A total of 57 anchovy schools were observed between Camp Pendleton and "The Barn." The usual concentration of anchovies was sighted between San Diego and the United States-Mexican Border where 62 schools were counted. Traces of red tide were also seen in that area.

No sardine or mackerel schools were seen on any days of the flight.

Note: See Commercial Fisheries Review, October 1962 p. 11.

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MIDWATER TRAWLING FOR SALMON FINGERLINGS CONTINUED:

M/V "Nautilus" Cruise 62-N-8a-Salmon (August 7-10, 1962) and 62-N-8b (August 20-24, 1962):

Mid-water trawl operations in the Carquinez Strait for marked salmon fingerlings on their seaward migration were continued by the California Department of Fish and Game research vessel Nautilus. A nylon midwater trawl with 25-foot square opening was used.

Trawling in Carquinez Strait was conducted between 8 a.m. and 3 p.m. and each tow was for 20 minutes. All tows were al-

ternated between upstream and downstream, and between the north shore, center, and south shore of the channel.

A total of 101 tows completed in the Strait during the cruises yielded a catch of only 19 king salmon (Oncorhynchus tshawytscha). No marked salmon were caught.

Pacific saury (Cololabis saira) was a new species appearing for first time since mid-water trawling by the Nautilus began on April 10, 1961.

Note: See Commercial Fisheries Review, October 1962 p. 10.

* * * * *

ANNUAL SALMON SPAWNING SURVEY STARTED:

The annual survey of California's salmon spawning stock on all salmon streams in the Central Valley was started on October 1, 1962, by the California Department of Fish and Game. It will continue through the middle of January 1963.

Most of California's salmon sport fishery is in the survey area which extends from Redding south into the San Joaquin Valley. Fourteen State fish and game assistants and fisheries men were scheduled to work full time on the project during the survey period.

The annual survey is made to estimate the number of king salmon spawners, their spawning success and distribution in the streams, and to detect any adverse conditions affecting California's salmon resource. The survey includes aerial counts of individual spawning beds and of concentrations of spawning fish. Because salmon die after spawning, ground observers keep a count of spawned-out salmon carcasses so as to avoid duplication.

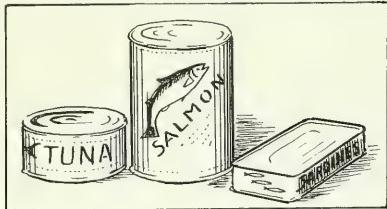
California's annual salmon spawning survey furnishes much of the basic information needed for managing its salmon resource, and provides data needed to evaluate water project developments which affect salmon.

Other Species Caught by the Nautilus on Cruises 62-N-8a and 8b	
Species	Number
Northern anchovy (<u>Engraulis mordax</u>)	134,000 est.
Pacific herring (<u>Clupea pallasi</u>)	1,500 est.
Jacksmelt (<u>Atherinopsis californiensis</u>)	1,300 est.
Striped bass (<u>Roccus saxatilis</u>)	368
American shad (<u>Alosa sapidissima</u>)	161
Sacramento smelt (<u>Spinachias thaleichthys</u>)	84
King salmon (<u>Oncorhynchus tshawytscha</u>)	19
Surfsmelt (<u>Hypomesus pretiosus</u>)	17
Starry flounder (<u>Platichthys stellatus</u>)	4
Staghorn sculpin (<u>Lepidotrigla armata</u>)	3
Northern midshipman (<u>Forichthys notatus</u>)	3
Shiner perch (<u>Cymatogaster aggregata</u>)	1
Rainbow trout (<u>Salmo gairdneri</u>)	1
White croaker (<u>Gymnemus lineatus</u>)	1
White sturgeon (<u>Acipenser transmontanus</u>)	1
White catfish (<u>Ictalurus catus</u>)	1
Pacific saury (<u>Cololabis saira</u>)	1



Cans--Shipments for Fishery Products, January-July 1962

The amount of steel and aluminum consumed to make cans shipped to fish and shellfish canning plants during January-July 1962 was 4.5 percent above that used during the same period in 1961. Prior to this year, the figures covered only tinplate cans, but beginning with January 1962 aluminum cans are included. It is believed that only a small amount of aluminum is being used in cans used for fishery products at present.



A total of 1,827,187 base boxes of steel (tinplate) and aluminum were used in the manufacture of cans shipped to fishery plants during the first seven months of 1962, whereas in the same period of 1961 (when only tinplate was reported), 1,747,703 base boxes of steel were consumed. The increase was mainly due to larger packs of Maine sardines, shrimp, salmon, and tuna during 1962.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14"x20" size. The 1962 data are derived by use of the factor 21.8 base boxes per short ton of steel.



Central Pacific Fisheries Investigations

FIRST RAFT EXPEDITION TO STUDY FISH BEHAVIOR NEAR OCEAN FLOTSAM:

Raft "Nenue" (September 26-October 13, 1962): A new and unique floating laboratory consisting of a 12-foot square raft called the Nenue was recently used off the Kona coast of Hawaii to study the makeup and behavior of the mixed fish communities which form under drift logs and other flotsam in the ocean. This first raft expedition (described as Koalana I) by the Honolulu Biological Laboratory of the U. S. Bureau of Commercial Fisheries was in conjunction with operations of the Bureau's research vessel Charles H. Gilbert. The raft was

used as a floating laboratory by three of the Bureau's scientists from September 27 to October 9.

The Charles H. Gilbert with the Nenue aboard sailed on September 26 for the raft's planned launching position off Napoopoo, Kona. The expedition was to return to its base at Kewalo Basin, Honolulu, on October 13.

The vicinity of any sizable drifting object often provides excellent fishing, particularly for dolphin (mahimahi) in Hawaiian waters, and is also an indication of tuna concentrations in some parts of the Pacific. The scientists studying tuna behavior are seeking information on (1) the association between fish and flotsam, (2) how the various members of such an aggregation react, and (3) how their reaction might be put to practical use in the commercial fisheries.

The Nenue is built of timbers, with a bamboo facing to provide a base for growth of seaweeds and sessile animals such as barnacles. Six oil drums under the raft give additional buoyancy. From the middle of the raft a 6-foot metal cylinder, closed at the bottom and equipped with six glass-viewing ports, protrudes down into the water. A small house protects the observers from the weather and shades the inside of the observation capsule for better visibility.

The observers worked aboard the raft, one in the underwater chamber and one on deck. The fish, birds, and marine mammals which gathered under and around the Nenue were recorded and photographed. Detailed notes were taken on their behavior toward the raft and toward one another. At the same time, similar observations were made from the deck and the underwater observation chambers of the Charles H. Gilbert at various distances from the raft. Plankton collections, water temperature and salinity measurements, and weather observations also were made from the accompanying research vessel. The work was limited principally to daylight hours.

* * * * *

MACHINE TABULATING EQUIPMENT USED TO ANALYZE CRUISE OBSERVATIONS:

The fishery resources and oceanic environment of the central Pacific Ocean have been studied for the past 12 years by biologists of the U. S. Bureau of Commercial Fish-

eries Biological Laboratory at Honolulu, Hawaii. More than 150 cruises have been made between 1950 and 1962 by the laboratory's research vessels and chartered fishingboats. Many of those cruises were long trips over immense stretches of the Pacific, extending from the Society Islands and New Caledonia in the South Pacific to the Aleutians on the north, and from the United States coast to Wake Island in the northwestern Pacific. Routine watches for fish schools and bird flocks (which indicate the presence of fish schools) were kept on each cruise, and all sightings have been recorded. Laboratory records of these cruise observations were recently tabulated on IBM machine-sort cards in a way that permits their analysis in terms of sightings per hour of scouting.

The observations data have been compiled to show the geographical and seasonal distribution of sightings of bird flocks, all fish schools, and schools identified as skipjack tuna. The result is a series of 12 charts, each covering 3 months of the year and showing the number of sightings per 10 hours of scouting for each 5-degree square.

Within the area between latitudes 20° S. and 30° N., longitudes 110° W. and 180°, the charts make certain features of the distribution immediately apparent. Fish schools and bird flocks are most numeous near island groups, and are very scarce throughout the intervening oceanic areas. Sightings of all fish schools, of skipjack schools, and of bird flocks were most frequent in the Marquesas, Tuamotu, and Society Islands of French Polynesia, followed by the Line Islands and then the Hawaiian Islands. Skipjack schools were 6 times as numerous in the Marquesas as in the Hawaiian area during December to February, while from June to August they were seen in about equal numbers in both regions. The heaviest concentration of bird flock sightings appears in the Christmas Island area of the Line Islands.

These charts also prominently show the seasonal changes in the apparent abundance of schools and bird flocks. In the Hawaiian area there is a definite seasonal trend with sightings at a maximum from June to August. In the waters around the Marquesas Islands, the seasonal trends are less well defined, especially in the sightings of bird flocks, but there was a maximum of schools seen from December to February. The Line Islands did not show the uniform pattern of seasonal

distribution that might have been expected from their location close to the Equator. Sightings of bird flocks and of all fish schools were at a maximum during March-May, with a secondary peak in fish school abundance indicated from September to November.

For the Hawaiian area, the charts point up a marked contrast between the northeastern sector, where sightings were conspicuously infrequent, and the higher sighting rates recorded for waters to the southwest of the Islands. Only during the summer months from June to August were bird flocks and fish schools at all numerous more than 100 miles northeast of the Hawaiian chain. At other seasons of the year they were either absent or present in very small numbers.

This series of charts is part of a projected summary of the past records of cruise observations by the Honolulu Biological Laboratory's scientists and fishermen. The use of automatic data processing methods will make it possible to produce similar graphic condensations of the results of extensive long-line, pole-and-line, and troll fishing in much of the same area.



Fishy Odors and Flavors

CONTRACT STUDY COMPLETED:

The final report on a project to investigate the origin and the nature of compounds responsible for undesirable fishy odors and flavors that develop in fish oils was submitted in September 1962 to the U. S. Bureau of Commercial Fisheries. The contract for the project, which is now completed, was awarded by the Bureau to the Hormel Institute, University of Minnesota, Austin, Minn. The project was under the supervision of the Bureau's Seattle Technological Laboratory.

The methods used in the study included separation of the odors and attempts to associate them with different components of the oil, isolation and identification of the highly volatile compounds present in fish oil, and studies on the auto-oxidation of purified fish oil methyl.

Note: See Commercial Fisheries Review, September 1962 p. 20.



Great Lakes Fishery Investigations

LAKE TROUT DISTRIBUTION STUDIES IN WESTERN LAKE SUPERIOR CONTINUED:

M/V "Siscowet" Cruise 6 (August 27-September 7, 1962): Studies to obtain information on the abundance and distribution of young lake trout in the Apostle Islands region of Lake Superior were continued during cruise 6 of the research vessel Siscowet (operated by the U. S. Bureau of Commercial Fisheries). Semiballoon trawls were used on this cruise. They were towed at 15 locations, at depths ranging from 6 to 31 fathoms. Small lake trout were caught at almost every station; one 15-minute tow east of Basswood Island yielded 137 small trout from six different plantings. Nearly all of the lake trout were found at depths between 20 and 25 fathoms.

Out of a total of 605 young lake trout caught during the cruise, 599 (99 percent) were fin-clipped. About 500 of the fish were returned alive to the water after removal of the anal fin, in an attempt to obtain information on population density. Only one of the re-marked fish was caught a second time.

The table lists the number of hatchery-reared lake trout caught in the Apostle Islands area to date in 1962 with completion of cruise 6, and the percentage of the total contributed by different plantings.

Number of Hatchery-Reared Lake Trout Caught by M/V <u>Siscowet</u> as of September 7, 1962						
Season and Year of Release	No. of Fish Planted	Age Group of Fish				
		No. of Fish Caught	% of Total Caught a Second Time	II (And Older)		% of Total Caught a Second Time
Spring 1962 (Bayfield, St. Croix Falls)	256,500	286	69.6	-	-	-
Spring 1962 (Pendills Creek)	120,800	125	30.4	-	-	-
Spring 1961 (Bayfield)	108,800	-	-	218	34.5	
Spring 1961 (Pendills Creek)	108,200	-	-	215	34.0	
Spring 1960 (Bayfield)	161,350	-	-	170	26.9	
Spring 1959 (Bayfield)	226,600	-	-	29	4.6	

Note: Recaptures of less than 10 fish from a single planting are not listed; the rearing station is given in parentheses in the first column.

Other species caught in the trawls included Coregonus hoyi chubs (as many as 116 in one 15-minute tow), smelt, pygmy whitefish, sculpins, and ninespine sticklebacks. Chubs (C. hoyi) and smelt were taken most commonly in tows which yielded large

numbers of lake trout. Sticklebacks and sculpins were most common in areas where few or no lake trout were caught.

Experimental gill nets (1- to 5-inch mesh by 1/2-inch intervals) set in 25 fathoms in Presque Isle Bay caught few fish, most of which were chubs.

Surface water temperatures ranged from 59.4° F. east of Bear Island to 66.2° F. in Punky Bay.

Note: See Commercial Fisheries Review, October 1962 p. 17.



Gulf Exploratory Fishery Program

SHRIMP MARKING STUDY IN GULF OF MEXICO CONTINUED:

M/V "George M. Bowers" Cruise 42 (September 19-October 4, 1962): The catching, staining, and release of brown shrimp (Penaeus aztecus) and white shrimp (Penaeus setiferus) were the main objectives of this cruise by the U. S. Bureau of Commercial Fisheries research vessel George M. Bowers. The vessel operates from the Gulf and South Atlantic Exploration and Gear Research Base at Pascagoula, Miss. This was another cooperative trip made jointly with the Bureau's Galveston Biological Laboratory, and was part of the initial phase of a continuing study to obtain a preliminary estimate of growth, mortality, and migration patterns of those shrimp species.

Staining of white shrimp was conducted in two areas off the Louisiana coast. In one of the areas, between Trinity and Tiger Shoals, 1,900 shrimp were stained with fast green dye and released in the 2- to 5-fathom depth range. In the other area between Cameron and Sabine, 2,200 shrimp were stained with a Trypan blue dye and released in the same depth range.

On this cruise, trawling was also conducted between Grand Isle and Trinity Shoal but too few shrimp were caught, and none was stained. The same situation existed in the 10- to 14-fathom depth range southeast of Freeport, Texas. Bad weather ended cruise operations at that point.

Note: See Commercial Fisheries Review, August 1962 p. 26.

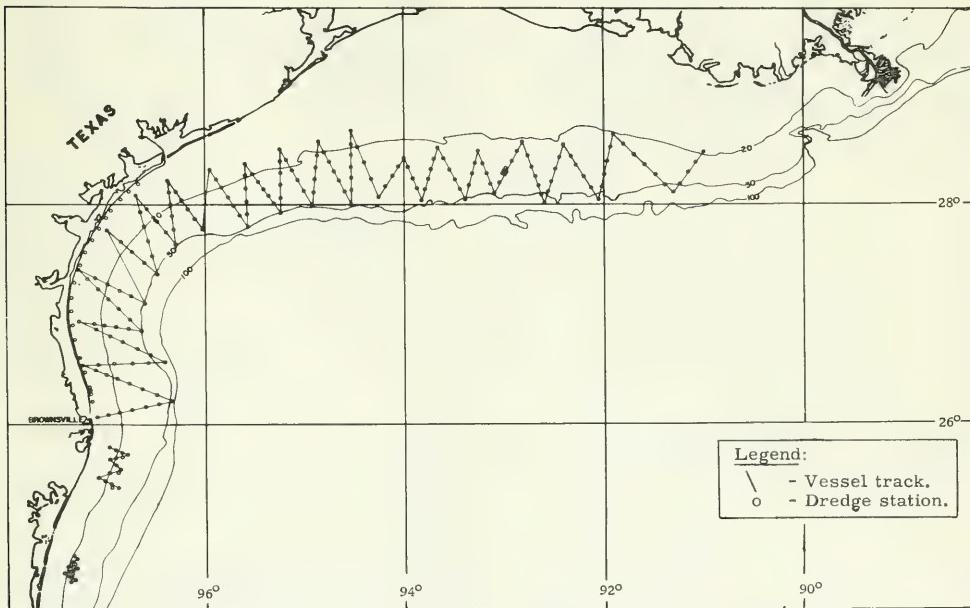
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**CLAM AND SCALLOP DISTRIBUTION
IN NORTHWESTERN GULF
OF MEXICO STUDIED:**

M/V "Oregon" Cruise 81 (September 11-October 2, 1962): To obtain seasonal information on offshore clam and scallop distribution along the Louisiana and Texas coastal areas were the main objectives of this cruise. The northwestern Gulf of Mexico was the general area explored during this 22-day trip by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon. A total of 231 exploratory dredge hauls lasting from 15 to 30 minutes each were made during the trip.

these were generally small. Both species showed an apparent preferential depth range of 21 to 40 fathoms. Catch rates fluctuated widely on this exploratory cruise, and only general patterns of density were determined.

The frequent incidence of Gulf clams and paper-shell scallops in the middle shelf zone was observed during earlier shrimp explorations by the Oregon. A preliminary evaluation of meat quality and yield for both these species indicated a commercial potential, but concentrations and seasonal condition and yield would first have to be delineated.



Shows the station pattern for cruise 81 of the M/V Oregon (September 11-October 2, 1962).

Two hundred 5- and 6-foot tumbler dredge stations were made in the 4 to 80 fathom depth range between Ship Shoal, La., and Brownsville, Tex. An additional 31 tumbler dredge stations were made south of Brownsville off Laguna Madre, Mexico.

Paper-shell scallops (Amusium papyraceum) and deep-water Gulf of Mexico clams (Pitaria cordata) were observed throughout the survey area, although concentrations of

The relatively small individual catches made during cruise 81 were not significant enough for conclusive yield studies.

The vessel made port calls at Galveston on September 17, and at Brownsville on September 23.

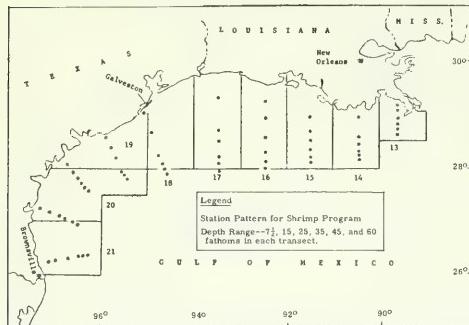


Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Belle of Texas" Cruise BT-24 (July 26-August 1, 1962): Five statistical areas were covered on this cruise and a 45-foot shrimp trawl was used. One 3-hour tow was made in each of the 3 depth ranges in each area. The vessel (operated by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries in studying the distribution of shrimp in the Gulf of Mexico) returned to her home port on August 1.

Concentrations of medium brown shrimp counting 31-40 to the pound were found at 0-20 fathoms in area 14 (12 pounds) and area 16 (67 pounds). A few pounds of larger white and pink shrimp were caught in the same depth range in both areas. Seven pounds of 21-25 count brown shrimp were found in the 20-40 fathom depth range of area 14, and from 40-60 fathoms of the same area, 3 pounds of 12-15 count brown shrimp were caught.



Shows station pattern for cruise BT-24 of the M/V Belle of Texas, July 26-August 1, 1962.

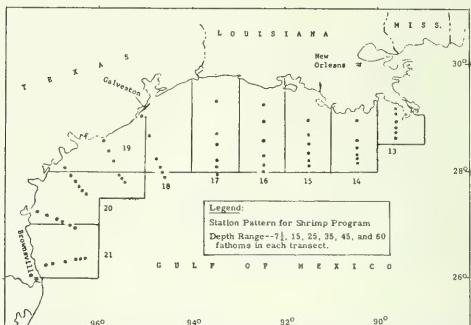
Area 16 yielded 12 pounds of 12-15 count brown shrimp from the 20-40 fathom depth range and 3 pounds of the same size and species from 40-60 fathoms, as well as the larger catch of medium shrimp from the shallower depth.

Tows in the 3 depth ranges of areas 13, 15, and 17 yielded small catches of various sizes of brown shrimp--in area 13, only 3 pounds of 12-15 count shrimp from 40-60 fathoms, and 10 pounds each of 41-50 count in 0-20 fathoms and 21-25 count from 20-40 fathoms.

In area 15, brown shrimp (13 pounds) 12-15 count were caught at 40-60 fathoms. Six pounds of 12-15 count brown was taken from area 17 evenly divided between 2 depth ranges; nothing was caught in 0-20 fathoms of that area.

M/V "Belle of Texas" Cruise BT-25 (August 9-14, 1962): In all areas covered by the M/V Belle of Texas during this cruise, nearly all brown shrimp were caught, except for less than one pound each of large white and pink shrimp. A 45-foot shrimp trawl was used, and one 3-hour tow was made in each of the 3 depth ranges.

Of the 4 statistical areas worked, area 18 yielded the largest catch--69 pounds of 31-40 count shrimp from the 0-20 fathom depth range, and 6 pounds of 21-25 count from 20-40 fathoms. There was no catch from the tow in 40-60 fathoms.



Shows station pattern for cruise BT-25 of the M/V Belle of Texas, August 9-14, 1962.

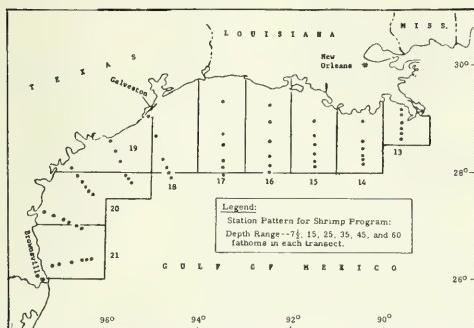
Nine pounds of 51-67 count shrimp were found in 0-20 fathoms of area 19. The amount caught in other depths of the same area were small--only one pound of 12-15 count at 20-40 fathoms, and 3 pounds of 9-12 count at the 40-60 fathom depth.

The catch from 0-20 fathoms in area 20 was 36 pounds of 51-67 count shrimp and only negligible amounts of white and pink shrimp. Larger shrimp of 15-20 count were caught in 40-60 fathoms of the same area.

Shrimp 12-20 count were found in area 21 at depths of 20-40 and 40-60 fathoms--3 pounds from each depth range. The tow in 0-20 fathoms yielded only one pound of small shrimp.

M/V "Belle of Texas" Cruise BT-27 (September 7-12, 1962): Shrimp catches by the research vessel Belle of Texas were almost negligible and confined mostly to small and medium brown shrimp from the 0-20 fathom depth range. The few pounds of white and pink shrimp caught in that depth range were all 21-25 count to the pound.

Each of the 4 statistical areas (18 through 21) covered on this cruise were off the coast of Texas from Galveston down to Brownsville. A 45-foot shrimp trawl was used, and one 3-hour tow was made in each of the 3 depth ranges of the areas worked.



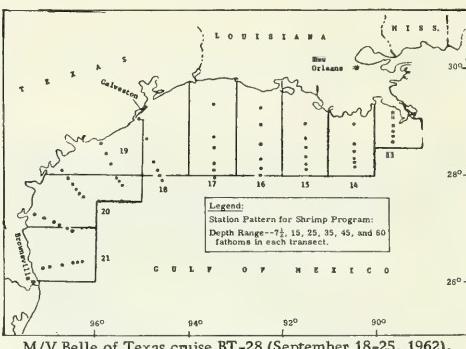
Shows the station pattern for cruise BT-27 of the M/V Belle of Texas, September 7-12, 1962.

Shrimp catches were less than 10 pounds per haul in all depth ranges except from 0-20 fathoms which yielded 80 percent of the total shrimp catch (less than 150 pounds) in the 4 areas covered. Shrimp caught in that depth range were all brown shrimp, counting mostly 41-50 to the pound, plus a scattering of white and pink shrimp. The 0-20 fathom depth range in area 21 yielded 30 pounds of 21-25 count brown shrimp, and 2 pounds of pink shrimp of the same size.

The largest catch of any area was slightly less than 50 pounds in area 19-44 pounds of 41-50 count brown shrimp and about 3 pounds of 21-25 count white and pink shrimp. The same area yielded only a handful of larger brown shrimp of 9-15 count from the 20-60 fathom depths. The other 3 areas worked on this cruise yielded an average of 9 pounds each of larger shrimp of 9 to 15 count, and

some 15-20 count from the 20-60 fathom depth ranges.

M/V "Belle of Texas" Cruise BT-28 (September 18-25, 1962): Large brown shrimp counting 12-20 to the pound predominated in catches by the research vessel Belle of Texas (operated by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries) in studying the distribution of shrimp in the Gulf of Mexico.



M/V Belle of Texas cruise BT-28 (September 18-25, 1962).

Five statistical areas were worked on this 8-day cruise, and a 45-foot shrimp trawl was used. One 3-hour tow was made in each of the 3 depth ranges in each area.

Area 16 yielded the largest catch (43 pounds) of any area--75 percent was 12-15 count brown shrimp, most of it from the 20-40 fathom depth range. The depth up to 20 fathom in that area accounted for the rest of the catch consisting of 10 pounds of 15-20 count brown shrimp.

The next largest catch of a little more than 20 pounds was from area 17 which also yielded large brown shrimp counting 12-20 to the pound from all depth ranges. Less than one pound each of 12-15 count white and pink shrimp were caught in 0-20 fathoms of that area.

Shrimp catches in the other 3 statistical areas covered on the cruise were small, ranging from 12 to 18 pounds. These were mostly large shrimp from all of the 3 depth ranges except 0-20 fathoms which yielded very small amounts of 31-40 and 51-67 count

brown and white shrimp. There was also a catch of 7 pounds of 26-30 count brown shrimp from 0-20 fathoms in area 14.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See Commercial Fisheries Review, October 1962
p. 21.



Industrial Fishery Products

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, Jan.-Aug. 1962: Based on domestic production and imports, the United States available supply of fish meal for the first 8 months of 1962 was 33,135 short tons or 9.0 percent greater than during the same period of 1961. Domestic production was 16,299 tons or 7.3 percent lower, but imports were 49,434 tons or 34.0 percent greater



Fig. 1 - Steam power is needed in fishery byproducts plant. It is used to cook the raw fish, evaporate the water in making condensed fish solubles, and in many plants, for heating the meal dryers. This is a scene in a plant at Moss Point, Miss.



Fig. 2 - Raw fish at the dock of a menhaden industrial products plant in Moss Point, Miss. The large hose at the right is clamped to a standpipe through which the menhaden are pumped from the bottom of the hold when the vessel is unloaded.

than in the same 8 months of 1961. Peru continued to lead other countries with shipments of 146,195 tons during the first 8 months of 1962--52,462 tons above the imports in the same period of 1961.

The total United States supply of fish meal in calendar year 1961 of 529,100 tons exceeded the peak year 1959 when the quantity amounted to almost 440,000 tons.

The United States supply of fish solubles (including homogenized fish) during January-August 1962 was 9,378 tons more than during the same period in 1961. Domestic production increased 8.0 percent, but imports jumped 123.5 percent.

Item	U. S. Supply of Fish Meal and Solubles, January-August 1961 and Total for 1961		
	Jan.-Aug. 1/1962	1961	Total 1961 (Short Tons)
Fish Meal and Scrap:			
Domestic production:			
Menhaden	175,649	193,177	247,551
Tuna and mackerel	13,728	13,458	21,243
Herring	2,627	4,462	5,268
Other	15,171	12,377	37,203
Total production	207,175	233,474	311,265
Imports:			
Canada	30,765	29,590	38,218
Peru	146,195	93,733	151,439
Chile	8,146	9,743	12,074
Angola	-	1,543	1,543
So. Africa Republic	9,184	9,756	13,026
Other Countries	706	1,197	1,545
Total imports	194,996	145,562	217,845
Available fish meal supply ..	402,171	369,036	529,110
Fish Solubles:			
Domestic production 2/.....	89,079	82,474	112,241
Imports:			
Canada	1,126	819	1,001
So. Africa Republic	1,091	946	1,351
Other Countries	2,801	480	4,387
Total imports	5,018	2,245	6,739
Available fish solubles supply ..	94,097	84,719	118,980

1/Preliminary.

2/50-percent solids. Includes production of homogenized condensed fish.

* * * * *

U. S. FISH MEAL, OIL, AND SOLUBLES:

Production, August 1962: During August 1962, a total of 39,000 tons of fish meal and scrap and 4.3 million gallons of marine-animal oils were produced in the United States. Compared with August 1961, this was a decrease of 18,600 tons or 32 percent in meal and scrap production and 2.3 million gallons or 35 percent in oil yield.

Menhaden meal amounted to 33,400 tons--accounting for 86 percent of the August 1962 meal total. Oil from menhaden (3.9 million gallons) comprised 91 percent of the August 1962 oil production.

Product	August		Jan.-Aug.		Total 1961
	1/ 1962	1961	1/ 1962	1961	
Fish Meal and Scrap:					
Herring	788	1,179	2,627	4,462	5,268
Menahaden 2/	33,366	51,818	175,649	193,177	247,551
Sardine, Pacific	2/17	-	2/706	-	2,518
Tuna and mackerel	2/2,111	2,080	2/13,728	13,458	21,243
Unclassified	2,673	2,460	14,465	12,377	14,757
Total	38,955	57,537	207,175	223,474	291,337
Shellfish, marine-animal meal and scrap	3/	3/	3/	3/	19,928
Grand total meal and scrap	3/	3/	3/	3/	311,265
Fish solubles	15,883	16,883	81,014	73,777	100,551
Homogenized condensed fish	-	2,802	8,065	8,697	11,690
Oil, body:					
Herring	194,068	230,773	527,725	637,530	818,017
Menahaden 2/	3,918,942	5,955,991	20,761,354	24,061,049	31,355,570
Sardine, Pacific	2/1,373	-	2/20,484	-	86,167
Tuna and mackerel	2/77,246	82,352	2/402,799	375,177	762,509
Other (including whale)	134,337	353,251	608,394	1,046,199	1,386,542
Total oil	4,325,966	6,622,367	22,320,756	26,119,955	34,408,805

1/Preliminary data.
2/Includes a small quantity produced from thread herring.
3/Not available on a monthly basis.

There were 15,900 tons of fish solubles produced in August 1962--1,000 tons below the same month of the previous year. There was no homogenized condensed fish produced in August 1962 as compared with 2,800 tons in the same month of 1961.

During the first 8 months of 1962, meal and scrap production totaled 207,200 tons--



Adjusting valve on a steam pump in the fish solubles unit of a fishery byproducts plant in Empire, La.

16,300 tons below the same period of 1961. The marine-animal oil yield totaled 22.3 million gallons--a drop of 3.8 million gallons as compared with the same period in 1961.

* * * * *

MAJOR INDICATORS FOR U.S. SUPPLY, SEPTEMBER 1962:

For the first nine months of 1962, United States fish meal and fish oil production was lower by 4.1 percent and 8.0 percent, respectively, as compared with the same period of 1961. Fish solubles production increased 8.3 percent.

Item and Period	1962	1961	1960	1959	1958
Fish Meal:					
Production 1/:					
November	-	10,058	8,725	10,797	9,749
October	-	16,852	24,455	22,026	11,630
September	31,800	28,642	36,239	36,874	33,185
Jan.-Aug.	207,175	220,559	180,152	191,089	144,415
Jan.-Dec. prelim. totals 2/	-	289,039	257,969	275,396	216,510
Jan.-Dec. final tots	-	311,265	290,137	306,551	248,140

(Table continued on following page)

Major Indicators for U. S. Supply of Fish Meal, Solubles, and Oil, September 1962 (Contd.)					
Item and Period	1962	1961	1960	1959	1958
.....(Short Tons).....					
Imports:					
November	-	25,649	6,149	3,673	6,082
October	-	9,425	12,515	3,821	5,899
September	-	13,941	9,487	9,224	5,079
August	28,253	19,026	8,340	5,695	5,310
January-July	166,743	126,536	79,506	105,004	69,492
January-December	-	217,845	131,561	132,925	100,352
Fish Solubles:					
<u>Production</u> ^{3/} :					
November	-	5,140	3,524	4,628	8,888
October	-	8,459	7,192	12,487	8,867
September	12,600	11,232	12,573	23,979	23,049
January-August	89,079	82,654	72,743	118,836	83,068
Jan.-Dec. totals	-	112,241	98,928	165,359	130,177
Imports:					
November	-	3,649	232	3,089	867
October	-	110	-	1,908	2,548
September	-	263	38	1,732	253
August	422	318	180	4,718	2,819
January-July	4,596	1,927	2,614	14,763	2,900
Jan.-Dec. totals	-	6,739	3,714	26,630	14,567
Fish Body Oils:					
.....(1,000 Gallons).....					
<u>Production:</u>					
November	-	1,360	1,202	1,147	1,028
October	-	1,901	3,024	2,176	1,139
September	4,000	3,224	3,939	2,888	3,689
January-August ^{4/}	22,321	25,392	17,482	16,187	13,726
Jan.-Dec. prelim. totals	-	33,471	26,690	24,418	21,625
Jan.-Dec. final totals	-	34,409	27,853	24,945	21,977
Exports:					
November	-	190	1,952	813	2,037
October	-	2,027	501	1,911	3,591
September	-	1,269	1,861	1,129	665
August	4,436	1,774	186	2,449	752
January-July	8,418	9,673	12,457	10,351	5,111
Jan.-Dec. totals	-	16,331	19,154	19,264	12,539

^{1/} Does not include fish meal, shrimp and miscellaneous meals.

^{2/} Preliminary data computed from monthly data. Fish meal production reported currently comprised 86 percent of the annual total for 1958, 90 percent for 1959, 89 percent for 1960, and 92 percent for 1961.

^{3/} Includes homogenized fish.

^{4/} Preliminary data computed from monthly data. Represents over 95 percent of the total production.

Note: Data for 1962 and 1961 are preliminary.



Nautical Charts

FOLDED INTRACOASTAL CHARTS FOR SMALL CRAFT NAVIGATION:

Plans to produce a "compact series" of Intracoastal Waterway Charts were announced by the Coast and Geodetic Survey, U. S. Department of Commerce, on October 7, 1962, following one of the most active boating seasons in the Nation's history. The plan is to produce a chart format that will not be awkward and unwieldy when used for small craft navigation.

New Intracoastal Charts will be accordian folded, measuring only 7-3/8 by 15 inches and easy to handle even in the smallest skiff or dinghy.

In recent years the largest market for Intracoastal Charts has been among the pleasure boatmen; in many areas, particularly along the Gulf Coast, however, commercial traffic in the waterway has contributed substantially to the economic stability of many coastal communities. In reshaping these charts for greater handling ease and utility, the Coast and Geodetic Survey has considered both the commercial boatman and the small craft operator. The chart quality has not been compromised in any way that would impair navigational safety.

**WATCH HILL TO
NEW HAVEN**
RHODE ISLAND - CONNECTICUT

Long Island Sound

SMALL-CRAFT SERIES
CHARTS 116-1, 116-2, 116-3

U. S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY
WASHINGTON, D. C.

PRICE \$1.50

Although Intracoastal Waterway Charts are not new, having first been published in 1936, the Agency's cartographers and a cross-section of boat owners are quite enthusiastic about the folded format.

"We are providing the boat operator with much more than just a chart in this folded edition," commented the Chief of the Agency's Nautical Chart Division. "Within its protective wrap-around cover, the folio contains just about everything the mariner needs to know, including annual tide tables, a complete tabulation of supplies and facilities, direction and velocity of tidal currents, information on marine weather services, and much more--all in the package," he said.

The Intracoastal Waterway is a protected route, with some exceptions, for vessels between Boston, Mass., and the Rio Grande, a distance of approximately 2,900 miles. Navigation is restricted, however, by the limiting depths which in some places is only 5 feet. Generally the project depth is 12 feet or more. Long canals have been cut through dry land in several areas such as the canals between Norfolk, Va., and Albemarle Sound, N.C.

More than 60 Intracoastal Waterway Charts rim the Atlantic and Gulf Coasts of the United States from Norfolk, Va., to Brownsville, Texas.

The first remodeled charts are scheduled for issue early in 1963. These are No. 824, Sandy Hook to Little Egg Inlet,

New Jersey, and No. 829, Norfolk, Va., to Albemarle Sound, N.C.

With the exception of the New Jersey chart, reconstruction will begin at Norfolk and generally progress southward to Florida and into the Gulf of Mexico area.

It is contemplated that additional offshore hydrography will be added to the new editions, if space permits, to provide continuity for vessels plying between the waterway and the open sea. The expanded hydrography should render these charts more useful to the fishing fleets and the sports fishing industries.

In many ways, the new Intracoastal Chart folios will be comparable to the popular Small Craft Chart Series. Similar in size and utility, the new Intracoastals will be revised and published annually, usually to coincide with the boating season in each area.

Several years will be needed to convert all charts to the new compact format, to checkout the boating facilities through field inspection, and to assemble other complementary information planned for this unique Series. But Coast and Geodetic Survey chart-makers are going to keep a close watch on boating trends and developments in coastal areas and bolster the program where it is needed.



North Atlantic Fisheries

Exploration and Gear Research

OTTER-TRAWL NET WITH ELECTRIC FIELD TESTED:

M/V "Delaware" Cruise 62-9 (July 11-August 24, 1962): To test and evaluate the effect, if any, of an electric field upon the catch of a commercial otter trawl net when the field is used as an adjunct to the net, was the primary purpose of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. The tests were conducted in marine waters and in areas and at depths where commercial species could be fished. Positive results encourage both further research into this principle of fishing and the development of specific gear by which this method might be applied within various segments of the fishing industry. The electrical equipment used was experimental in nature and built by a Lewes, Del., firm as a result of their research in the field of electrical fishing equipment.

A No. 41 large mesh (4-1/2 inch internal measurement) polypropylene net was equipped for electric fishing with a system designed primarily to immobilize fish in the path of the advancing trawl. Comparative tows were made using this net with and without the electric field during alternate tows. Towing was conducted between positions determined by Loran bearings and

along depth contours in an area long enough to include two consecutive tows. By towing back and forth in the designated area, and alternating tows using electricity with tows not using electricity, the same area was fished by both methods during various phases of tide and other changes. The effect of variables were eliminated or minimized as much as possible. Electrical values were kept nearly alike although minor differences, due to changes in the configuration of the net and consequent small variations in the distance between electrodes, could not be controlled.

All fish caught were identified and counted. A volumetric measure was taken on all commercial species when the catch numbers were large enough to make this feasible.

Tests were conducted with the anodes in two positions: (1) grouped around the low voltage transformers and laced to the footrope and netting of the lower wings and bottom belly, and (2) laced to the headrope and netting of the upper wings and square. During both test series, the low voltage transformers were shackled to the footrope and the cathodes were laced to the netting in the afterpart of the lower belly.

Comparative catch results with anodes positioned on the footrope, and on the headrope, are shown in tables 1 and 2.

Table 1 - Comparative Catch Results With Anodes Positioned on Footrope

Grouped Species of Fish	Without Electric Field		With Electric Field		Comparison to Catch Made without Electric Field
	Total No. Fish Caught	Mean No. Fish Per Tow	Total No. Fish Caught	Mean No. Fish Per Tow	
Cod and haddock.....	982	42.7	1243	56.5	132.3
Flatfish (gray sole, dab, yellowtail, blackback)	730	31.7	1503	68.3	215.5
Trash fish (sea raven, sea pout, monkfish, dogfish, skate).....	141	6.1	253	11.5	188.5
Cartilaginous fish (dogfish, skate).....	260	11.3	245	11.1	98.2
Squid.....	360	15.7	747	34.0	254.0
Fish normally escaping large-mesh nets (herring, shad, whiting, red hake)....	297	12.9	1643	74.7	579.1

Note: Other commercial species were caught in too few numbers to use for comparison.

Table 2 - Comparative Catch Results With Anodes Positioned on Headrope

Grouped Species of Fish	Without Electric Field		With Electric Field		Comparison to Catch Made without Electric Field
	Total No. Fish Caught	Mean No. Fish Per Tow	Total No. Fish Caught	Mean No. Fish Per Tow	
Cod and haddock.....	272	14.3	509	29.9	209.1
Flatfish (gray sole, dab, yellowtail, blackback)	515	27.1	883	51.9	191.5
Trash fish (sea raven, sea pout, monkfish, dogfish, skate).....	107	5.6	198	11.7	209.9
Cartilaginous fish (dogfish, skate).....	128	6.7	204	12.0	179.1
Squid.....	678	35.7	540	31.8	89.1
Fish normally escaping large-mesh nets (herring, shad, whiting, red hake)....	217	11.4	772	45.4	398.2

Note: Other commercial species were caught in too few numbers to use for comparison.

The catch results from comparative tows made with the anodes in one position were considered separately from the catch results made with the anodes in the other position. That was to indicate the effect, if any, of the change in anode positions upon the quantity of fish caught. During the first series of tests, made with the anodes on the footrope, 45 successful tows were completed. Of that number, 22 were with the electric field and 23 were without the electric field. During the second series, made with the anodes on the headrope, 36 successful tows were completed. Of that number, 17 tows were with the electric field and 19 tows were without the field. Due to the unequal number of tows, the gross number of fish caught by each method was not a good basis for comparison. The average number of each species of fish caught per tow (mean) by each method was used for comparison purposes. The tables show the species grouped into arbitrarily-chosen categories instead of individually. Irregularities in the abundance and/or availability of fish may cause considerable variation in catch results; the number of tows made (a total of 81) was too few to expect definite values to be determined. In general, the results may be considered indicative of final values that could be determined through extended testing.

Evaluation of this method of fishing, and the gear and equipment used during the tests, may be made from several directions. As the electrical equipment and accessory gear were experimental in nature, a number of difficulties, breakdowns, and other problems were to be expected. Nevertheless, with the exception of several components, the equipment performed satisfactorily. A more detailed description of the gear and component performance together with a more complete analysis of catch data is to be published at a later date.

Phase III of cruise 62-9 by the Delaware was devoted to herring sampling on Georges Bank under the direction of the Bureau's Boothbay Harbor Biological Laboratory.

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COMMERCIAL FISHING POTENTIAL OF OCEAN PERCH OFF NOVIA SCOTIA STUDIED:

M/V "Delaware" Cruise 62-11 (September 3-October 3, 1962): Bottom trawling operations to investigate the commercial potential

of ocean perch (Sebastes marinus) in waters deeper than those usually fished by commercial trawlers were conducted on the Continental Slope 100 miles north of Halifax, Nova Scotia, during this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. A total of 14 1-hour tows were completed in depths ranging from 175 to 525 fathoms on a 55-mile section of the slope.

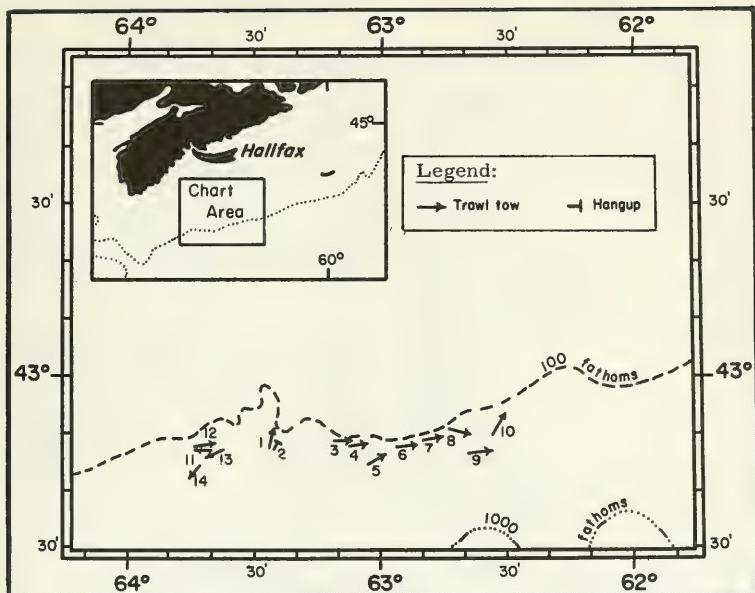


One of the larger catches of ocean perch buoys the cod end to the surface during haulback aboard the exploratory fishing vessel Delaware on cruise 62-11.

The four largest catches (2 estimated at 3,000 pounds and the other 2 at 2,000 pounds) were made at a mean depth of 300 fathoms. The larger catches were not comparable to the size of commercial catches, but they indicated a resource of large ocean perch (about 2-3 pounds each) at those depths and show some promise for projected explorations of the Continental Slope area.

Fishing gear used during the cruise consisted of a roller-rigged No. 41 manila net with 30 floats on the headrope, 5-fathom legs and 5-fathom ground cables. The ground cables were removed after the third tow to prevent gear damage from hang-ups on the extremely uneven bottom. There was only minor damage to fishing gear during the cruise and little time was lost making repairs. While average towing time from hook-up to knockout was approximately one hour, longer setting and hauling-back time in deep water required an over-all time of two hours on each tow.

Other commercial species caught in less than significant numbers included whiting



Cruise 62-11 of the exploratory fishing vessel Delaware investigated the commercial potential of ocean perch on the Continental Slope off Nova Scotia.

(silver hake), white hake, squirrel hake, cusk, Atlantic cod, American plaice (dab), Atlantic halibut, Greenland halibut, witch flounder (gray sole), and the red crab.

Preliminary identification of specimens preserved for continuing study included grenadiers (Macrouridae), snipe eels (Nemichthysidae), black dogfish (Centroscyllium fabricii), blue hake (Antimora rostrata), spiny eel (Notocanthus sp.), 2 specimens of blue whiting (Gadus poutassou), and Stomias sp.).



North Atlantic Fisheries Investigations

DISTRIBUTION AND ABUNDANCE STUDIES OF SEA SCALLOPS ON GEORGES BANK CONTINUED:

M/V "Delaware" Cruise 62-10 (September 11-20): To collect data on the distribution and abundance of sea scallops in the area from Northern Edge to the Southeast part of Georges Bank was the purpose of this cruise by the research vessel Delaware of the U.S.

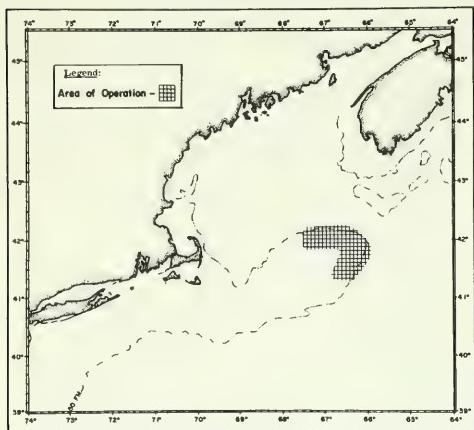
Bureau of Commercial Fisheries. The cruise was part of a continuing study to determine the population abundance and length composition of sea scallops on the offshore bank. Samples taken of Georges Bank sea scallops were to be used for comparison with similar samples collected previously.

A total of 29 unit areas were sampled during the cruise. Each unit consisted of 6 stations. Live scallops and clapper shells from 199 tows at 174 stations were measured, and condition of spawning observed. A 10-foot standard dredge with a 2-inch ring bag was used, and each tow lasted 10 minutes. The distance of each tow was measured with a standard odometer, and a new experimental odometer was tested simultaneously.

Samples of scallops were brought back to the laboratory for length-weight ratios, aging, and spawning studies. These will be reared in specially-designed tanks to conduct biological research on growth rates.

Five additional 5-minute tows with a 30-inch Digby-type dredge having a 1/2-inch mesh liner were made at designated stations,

Samples from those 5 tows were to be studied to determine bottom organisms and bottom types.



Sea scallop survey on Georges Bank by the research vessel Delaware, September 11-20, 1962.

Hydrographic information was collected at hourly intervals from 210 stations while steaming to and from Georges Bank.

Note: See Commercial Fisheries Review, July 1962 p. 33.

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FLUKE TAGGING EXPERIMENT:

About 1,000 fluke were tagged in September 1962 at inshore locations between Point Judith, R. I., and Block Island. This tagging experiment was conducted by biologists of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Woods Hole, Mass. Tagged fish returned from this experiment will complement the results of previous offshore tagging east of Hudson Canyon, which showed a summer inshore movement to Long Island and southern New England fishing grounds.

The recent fluke tagging experiment will add further information on the geographical limits of the fluke population which appears to inhabit the northern part of the Middle Atlantic Bight.

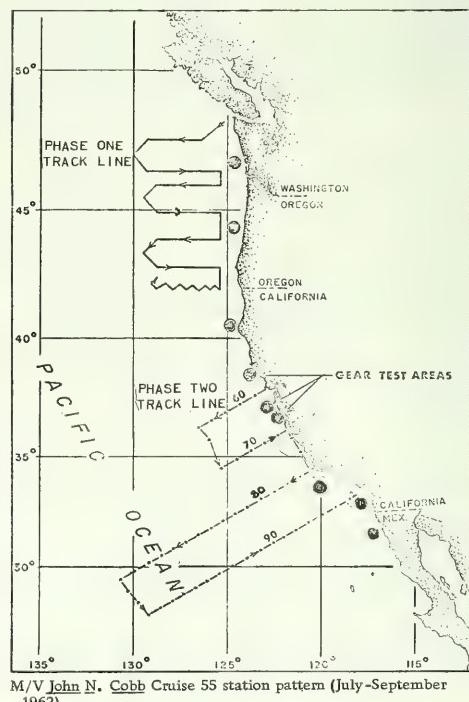


North Pacific Exploratory Fishery Program

OCEANIC FISH SURVEY AND MIDWATER TRAWL TESTS OFF PACIFIC NORTHWEST AND CALIFORNIA COASTS CONTINUED:

M/V "John N. Cobb" Cruise 55: To study the oceanic or offshore fish off the coasts of Washington, Oregon, and southern California and to test the fishing capabilities of a large midwater trawl, were the primary objectives of the July 9-September 21, 1962, cruise of the U.S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb.

The vessel returned to its base at Seattle after completing 11 weeks of exploratory fishing and gear testing in cooperation with the Bureau's San Diego and La Jolla Biological Laboratories, the Oregon Fish Commission, and the California Department of Fish and Game. Total mileage traveled during the cruise exceeded 8,000 nautical miles.



M/V John N. Cobb Cruise 55 station pattern (July-September 1962).

Primary objectives of the cruise were: (1) To obtain information on the relative abundance and distribution of albacore tuna by systematic sampling with trolling lines and correlation with attendant oceanographic conditions; (2) sampling of offshore waters to determine the relative abundance of all pelagic species at predetermined stations by conducting oblique tows from 220 fathoms to the surface, using a recently developed giant midwater trawl (Cobb pelagic trawl, Mark II); and (3) testing the utility of the Cobb pelagic trawl as a biological sampling tool and its efficiency for possible commercial application.

Regions surveyed during phase I (albacore trolling) extended from 48° N. Lat. to 42° N. Lat. and seaward from the coasts of Washington and Oregon to 130° W. Long. During phase II, waters between 38° N. Lat. and 27° N. Lat. extending seaward from the California and Mexican coasts to 130° 36' W. Long. were surveyed. During phase III, tests of the Cobb pelagic trawl were conducted in the coastal waters off Mexico, California, Oregon, and Washington.

Albacore Trolling (Phase I): Trolling was conducted during daylight hours along predetermined track lines with generally good results. A total of 235 albacore tuna was taken. All albacore in suitable condition (total of 150) were tagged and released. Tuna not in suitable tagging condition were frozen for future technological studies. Experimental freezing procedures were tested by a cooperating scientist from the Bureau's Technological Laboratory, Seattle, Wash.

Attendant oceanographic data were collected by a cooperating scientist from the Bureau's Biological Laboratory, San Diego, Calif.

Regions surveyed during phase I extended from 48° N. latitude to 42° N. latitude and seaward from the coasts of Washington and Oregon to 130° W. longitude.

Offshore Pelagic Trawling (Phase II): Forty-four stations were occupied off southern California and Mexico using the John N. Cobb's midwater trawl. Oblique tows from 220 fathoms to the surface were made at each station during daylight hours. At least one of each series of night tows was made on the surface. With the exception of one night surface tow in which 24 horse mackerel

were taken, catch rates in phase II were poor. Echo-soundings taken at all stations indicated no fish concentrations. Scatters noted were typical of those associated with the deep scattering layer.

List of Fishes Taken by the <u>John N. Cobb</u> Pelagic Trawl During Phases II and III of Cruise 55, August-September 1962	
Scientific Name	Common Name
<i>Vinciguerria</i> sp.	
<i>Tetraracora californica</i>	Electric ray
<i>Palometa simillima</i>	California pompano
<i>Erimia raii</i>	Pomfret
<i>Tarletonbeania crenularis</i>	Lanternfish
<i>Trachypterus rex-salmonorum</i>	King of the salmon
<i>Angyopelecanus lychnus</i>	Hatchetfish
<i>Seriola dorsalis</i>	Yellowtail
<i>Leuroglossus stilius</i>	No common name
<i>Caulolepis longidens</i>	No common name
<i>Mola mola</i>	Ocean sunfish
<i>Diaphus theta</i>	Lanternfish
<i>Melamphaes</i> sp.	-
<i>Argentiniidae</i> sp.	-
<i>Regalecidae</i> sp.	King of the herrings
<i>Electrona arctica</i>	Bigeye lanternfish
<i>Iridacanthidae</i> sp.	-
<i>Bathylycus milleri</i>	No common name
<i>Gonostomatidae</i> sp.	-
<i>Glyptocephalus zachirus</i>	Rex sole
<i>Citharichthys sordidus</i>	Mottled sandad
<i>Alepocephalus tenebrosus</i>	No common name
<i>Malacocephalidae</i> sp.	-
<i>Merluccius productus</i>	Hake
<i>Sardinops sagax</i>	Pacific sardine
<i>Sarda chiliensis</i>	Bonito
<i>Pneumatophorus diego</i>	California mackerel
<i>Roncador stearnsi</i>	Spotfin croaker
<i>Sphyraena argentea</i>	Barracuda
<i>Aetobatus californicus</i>	Whip ray
<i>Sebastodes paucispinis</i>	Bocaccio
<i>Synaphuris atricaudus</i>	Tongue sole
<i>Porichthys notatus</i>	Midshipman
<i>Icichthys lockingtoni</i>	Brown rudderfish
<i>Oncorhynchus tschawytscha</i>	King salmon
<i>Sebastodes flavidus</i>	Yellow-tailed rockfish
<i>Saupea acanthias</i>	Dogfish shark
<i>Sebastodes brevispinis</i>	Silvery gray rockfish
<i>Sebastodes ruberrimus</i>	Turkey-red rockfish
<i>Trachurus symmetricus</i>	Horse mackerel
<i>Engraulis mordax mordox</i>	Anchovy
<i>Priacanthus clausa</i>	Blue shark
<i>Sebastodes goodei</i>	Chili pepper
<i>Anoplopoma fimbria</i>	Sablefish
<i>Tactostoma macropus</i>	Arrowfish
<i>Symbophorus californiae</i>	Lanternfish
<i>Lampanyctus leucopssarum</i>	Lanternfish
<i>Lampanyctus ritteri</i>	Lanternfish
<i>Hygophum</i> sp.	Lanternfish
<i>Diogenichthys atlanticus</i>	Lanternfish
<i>Notoscopelus respandens</i>	Lanternfish
<i>Ceratoscopelus townsendi</i>	Lanternfish
<i>Scomber japonicus</i>	No common name
<i>Anoplaster</i> sp.	-
<i>Tarandichthys</i> sp.	-
<i>Cyclodione microdon</i>	Veiled anglemouth

During the latter half of phase II, offshore stations were occupied simultaneously by the Bureau's research vessel Black Douglas and the John N. Cobb. Observations of attendant oceanographic conditions and comparison tows with plankton and stramin nets were made by the Black Douglas.

A correlation of relative effectiveness of the three sampling gears (midwater trawl, plankton net, and stramin net) will be attempted in the near future.

During phase II, waters between 38° N. latitude and 27° N. latitude extending seaward from the California and Mexico coasts to 136° 36' west longitude were surveyed.

Gear Tests (Phase III): During the early part of Phase III, 13 surface tows and 3 mid-depth tows using the John N. Cobb's midwater trawl were made in nearby waters off San Diego. During the latter part of Phase III, 11 drags (3 near surface and 8 at mid-depth) were made off the coasts of California, Oregon, and Washington. A total of 56 different species of fish were taken in the midwater trawl during the tests. The largest catches were made about 10 miles north of Heceta Bank, Ore., where a catch of 1,375 pounds of sablefish and 463 pounds of hake was made at 95 fathoms and a catch of 1,863 pounds of hake was made at 102 fathoms. A catch of 1,000 pounds of anchovy was taken at 42 fathoms about 30 miles south-southwest of San Francisco, Calif. The anchovy catch was estimated at 8,000 pounds when the net surfaced, but most of the catch escaped through the meshes of the cod end as the gear was hauled in.

Utility of the midwater trawl for gross biological sampling was demonstrated during the cruise by the wide variety of specimens taken. Commercial utility of the gear for capture of surface schools of fish was not proved, but commercial use of the gear for capture of midwater schools of fish shows considerable promise. A few drags made on good echo-sounding indications in midwater produced fair amounts of fish. Additional experiments using the gear on known fish concentrations will be required before the commercial potential can be determined.

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SHRIMP DISTRIBUTION OFF VANCOUVER ISLAND STUDIED:

M/V "John N. Cobb" Cruise 56 (October 15-November 16, 1962): To conduct shrimp explorations in the international waters off the west coast of Vancouver Island, British Columbia, was the purpose of this 5-week cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb. The main objective was to locate po-

tential commercial shrimp fishing grounds in the area from Cape Beale to Cape Cook off Vancouver Island.

During the cruise, records were to be kept of the general topography of the ocean bottom, and oceanographic and meteorological conditions. The size and sex composition of the shrimp populations were to be determined, together with other pertinent information.

Methods of operation on this cruise included the application of transects using sonic equipment so as to determine the general bottom characteristics, and whether the area explored would be suitable for trawling. In areas where the bottom could be trawled, it was planned to make a series of tows with a Gulf of Mexico shrimp trawl in order to assess the distribution and abundance of shrimp.

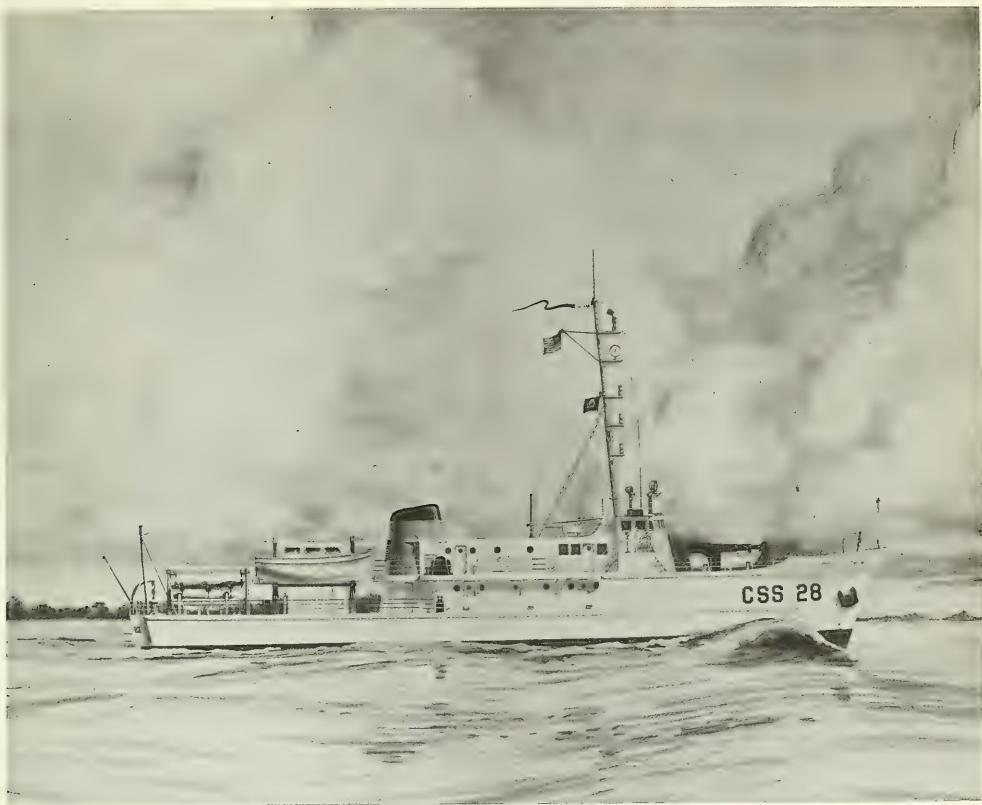


Oceanography

NEW COAST AND GEODETIC SURVEY RESEARCH VESSELS "PEIRCE" AND "WHITING":

The new U. S. Coast and Geodetic Survey research vessels Peirce and Whiting will be used for hydrographic and oceanographic work along the southeastern Atlantic Coast of the United States and in the Gulf of Mexico. The Peirce was launched October 15, 1962, at Point Pleasant, W. Va., on the Ohio River. The Whiting, an identical sister ship, was expected to be launched in November 1962. The combined cost of the two vessels, which were built under one contract, amounted to \$3,733,040. The new vessels will replace older vessels of the Coast and Geodetic Survey.

The Pierce measures 163 feet in length and has a displacement weight of 760 tons. It is equipped with controllable pitch propellers and two 800 ship hp. Diesel engines producing a total of 1,600 hp. Cruising speed is 12.5 knots. It has the most modern electronic and navigational equipment. The Pierce has an oceanographic laboratory as well as depth recorders, hydrographic winches, and other survey tools. The ship's reinforced steel hull will permit her use in Alaska and in the ice-covered waters of the Arctic if necessary. It will have a complement of 6 officers and 30 crewmen.



Artist's drawing of the Peirce, one of the new Coast and Geodetic Survey vessels.

Following the launching in West Virginia, the Peirce cruised down the Ohio and Mississippi Rivers for trials and commissioning in the Gulf of Mexico. The Peirce and her sistership will be assigned to Atlantic Coast ports near their working grounds thus saving many valuable hours in transit.

The Peirce was named to commemorate Charles Sanders Peirce, the noted 19th century American scientist and logician, and an employee of the Coast and Geodetic Survey between 1860 and 1890. His research and development in pendulums, map projections, and gravity made a lasting contribution to the Bureau's scientific standing. The Peirce will replace the Coast and Geodetic Survey

vessel Gilbert, a 77-foot research vessel built in 1930 which is now in a poor state of repair.

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NEW OCEANOGRAPHIC RESEARCH VESSEL NEAR COMPLETION:

A new oceanographic research vessel, the Atlantis II, was launched at the Maryland Shipbuilding and Drydock Company in Baltimore, Md., on September 8, 1962. The vessel, which was designed and built for the Woods Hole Oceanographic Institute with funds from the National Science Foundation will be completed about the end of 1962 at a cost of around \$3.9 million. After delivery

to the Institute, the vessel will make a few short trial cruises and then go to the Indian Ocean to participate in the International Indian Ocean Expedition which runs through 1964.

When completed, the Atlantis II will be about 210 feet long, with a waterline length of 195 feet. It will have a special bow observation chamber which will accommodate two observers, and will have 6 ports to view ahead, down, and up to the water surface at the stern.

The vessel was designed to provide maximum versatility in changing of instrumentation from one discipline to another, and to permit ease of modifications necessary at sea. It will have a central, or internal, well which will permit operations in higher sea conditions. The well will permit electronic, photographic gear, and other equipment to be handled, serviced, and repaired on the wire and under cover away from ice, rain, wind, and spray. By changing or closing the bottom opening, the space in the center of the well can be used for a number of other purposes such as a fuel tank, fish tank, wet or dry laboratory, or even cargo space for extra heavy equipment.

Scientific handling gear of the vessel includes a steam-powered trawl or deep-sea winch, a towed instrument or thermistor winch, 2 hydrographic winches, 2 bathythermograph winches, a hydraulically-actuated "A" frame, a center well hoist, and an interlaboratory hoist. Provision was also made for the installation of 2 portable laboratories, 1 on the main deck and the other on the upper deck of the vessel.

The vessel is designed to do effective all-weather oceanographic research work ranging from fringe ice areas to the tropics, and will be able to handle more than one scientific discipline on a given cruise. All living quarters, public rooms, laboratories, and other work facilities will be air conditioned. It will carry a complement of 25 scientists and a crew of 28, including officers.

The new research vessel was not built to replace the present Atlantis (I), according to the June 1962 issue of Oceanus published by the Woods Hole Oceanographic Institute, which stated that the two ships will be operating at the same time.



Oregon

FISH PASSAGE PROJECTS OF NEW SALMON REHABILITATION PROGRAM COMPLETED:

The first fish passage project under the Oregon Fish Commission's new 60/40 coastal salmon rehabilitation program was completed in September 1962 with dedication of the Mill Creek Falls fishway on Mill Creek. The Creek is a tributary of the Siletz River in Lincoln County. Two other fish passage projects under the same program were also completed and put into operation at the same time. Both are on Yaquina River tributaries, one on Little Elk Creek, and the other on Sloop Creek.

The Port of Toledo Commissioners, together with Oregon Fish Commission officials, expressed full satisfaction with the work while on an earlier and final inspection tour of the passage facilities. The work was done under terms of the new cost-share conservation program, and was financed 60 percent from funds specially appropriated by the last session of the State Legislature and 40 percent from funds provided by the Port of Toledo.

The State Legislature during its 1960 session, made \$120,000 available to the Fish Commission to be used in work that would increase salmon and steelhead production in coastal streams. Under terms of the appropriation, local interests in the individual counties put up 40 percent of the cost of approved stream rehabilitation projects. The share by local interests was to be in cash, or in equipment rental, labor, or materials.

The Mill Creek project involved blasting a fish ladder out of bedrock where a nine-foot waterfall had blocked passage of anadromous fish during most water stages. A concrete retaining wall was also constructed to prevent flooding out of the fishway during high water. Some silver salmon and a limited number of chinooks had been able to negotiate the falls during especially favorable water flows, but production above the falls had been limited and sporadic. Ten miles of spawning and rearing area for both salmon and steelhead has been made permanently available by the ladder.

On Little Elk Creek, rock quarry operations some years ago created falls that were impassable to anadromous fish. The Fish

Commission's laddering project has made available above this stream block an area of gravel sufficient to accommodate over 300 spawning salmon. The new Sloop Creek facility also makes available to salmon and steelhead a sizable reach of prime spawning gravel. The work at both Mill Creek and Sloop Creek was done by a Toledo contractor, while the Little Elk Creek job was handled by a local crew with Fish Commission equipment and supervision. The cost of the three projects totaled \$8,250, with the Port of Toledo providing \$3,300.

Numerous other projects under the 60/40 coastal salmon rehabilitation program are in various stages of negotiation and planning in Lincoln County as well as in the other coastal counties.

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OBSTACLE TO OCEANBOUND MIGRANT SALMON REMOVED:

The stranding of downstream migrant salmon and steelhead in river bank potholes on the east bank of the Willamette River in Oregon City's Clackamette Park, has long been an annual occurrence until recently. In September 1962, an engineering crew of the Oregon Fish Commission worked with a bulldozer and dump trucks to remove the virtual death-trap for these migrant fish.

Young steelhead and salmon were stranded each year in the Clackamette River bank potholes, especially during the late winter and spring months when downstream migration is in full swing. The frequent wide fluctuations of water level along the Willamette River added even more to the problem. Depletion of oxygen in the potholes, or actual drying up of the pools was responsible for heavy mortalities of the oceanbound migrant fish.

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PUBLIC HEARING HELD ON DUNGENESS CRAB FISHING REGULATIONS:

A public hearing on regulations governing Oregon's multimillion dollar crab fishery was held before the Oregon Fish Commission in Portland on October 10, 1962. The hearing was the result of widespread interest in the State's crab fishing regulations for the coming season. Findings of the Fish Commission's crab biological investigations were presented at the hearing.

Crab fishing regulations have for some time been a matter of deep concern to the fisheries agencies in California and Washington, as well as in Oregon. The coastwide problems associated with the management of the highly-important commercial dungeness crab fishery have been a major part of activities of the Pacific Marine Fisheries Commission, a coordination agency supported by funds provided by the fisheries agencies of Oregon, Washington, and California.

Oregon's State Fisheries Director said the purpose of the hearing was to allow the Fish Commission to evaluate all the information available as a basis for formulating the best possible regulations. The hearing was also considered timely in view of the Pacific Marine Fisheries Commission's annual meeting which was to be held in Seattle later in October.

In emphasizing the importance of Oregon's commercial crab fishery, the Director pointed out that Oregon crab landings during the past 8 years have averaged 9 million pounds a season with an ex-vessel value of nearly \$1.3 million a year. He added that the dollar value of Oregon's crab fishery is even greater when considering the investment in processing equipment and salaries to people in other segments of the crab industry.



Oysters

LONG ISLAND SOUND OBSERVATIONS ON SPAWNING AND SETTING AS OF SEPTEMBER 19, 1962:

Setting of Oysters: Setting of oysters continued at all stations as of September 19, 1962. It was the heaviest, however, at two stations in the Bridgeport area. This second wave of setting, which began about August 17 and was still going on as of September 19, although at a reduced rate, added a sufficient number of spat to those of the first wave to record 1962 as a year of good oyster setting in Long Island Sound, reports the U.S. Bureau of Commercial Fisheries Biological Laboratory, Milford, Conn.

At least one station in each major area caught a set of commercial importance. In New Haven an especially heavy set occurred at one station and in Bridgeport at two stations. If all spat survived, the station at New Haven would show approximately 45 young oysters on the inside surface of each cultch shell, while at one of the two stations at Bridgeport, this number would be approximately 54 per shell. Unfortunately, the majority of the young oysters of the Bridgeport area died within the first few weeks after setting and, regardless of the heavy initial set, many shells examined in September were blank.

This mortality is due to several causes, some of which we know and understand, such as predation by small drills,

recently-set flat worms (*Stylochis*, the great killer of young oysters), and to some extent, by starfish. Other causes, however, are still obscure and undetermined but we, tentatively, assume that they are bacterial or virus diseases or parasites. A close observation is being kept on the condition of the spat and anything suspicious in their appearance or behavior is investigated by our microbiologist. As has been reported in some of our scientific publications, we have isolated a number of bacteria that kill larvae and young spat, and we think that similar organisms may be involved in killing larvae and spat under natural conditions.

Contrary to the heavy mortality in the Bridgeport area, the oyster set of the first and second waves in New Haven Harbor was doing remarkably well. Examination of the material collected showed very rapid growth of young oysters. As determined last year, on the basis of the new experiment conducted this summer together with F. Mansfield & Sons Oyster Co., in New Haven Harbor, there is strong evidence that Polystream-treated shells collected more oyster spat than untreated shells and that the latter were considerably more fouled with different organisms, especially *Crepidula*, than the treated ones. Although the odor of Polystream can still be detected on the treated shells, the growth of young oysters on them seems to be better than on the untreated shells.

Perhaps treating of shells with different chemicals will prevent such undetermined mortalities as are occurring now in the Bridgeport area. This will have to be ascertained by a series of well-planned, critical experiments. Nevertheless, as the intensity of this year's setting has demonstrated, there is nothing wrong with Connecticut oyster-producing waters and, therefore, the industry should not only survive but, by using modern methods (including artificial methods of propagation, new methods to control predators and competitors, and chemical treatment of clutch) should become even more productive than in the past.

Setting of Starfish: While setting of oysters was heavier during the second part of the summer, setting of starfish was lighter. After about August 13 there was virtually no setting in the Milford and, especially, New Haven areas, although in Bridgeport recently-set starfish could occasionally be found on the collectors. The same as last year, two stations in the Bridgeport area led in the number of starfish set for the season, while one station (located in deep water in Milford) was also an area of relatively heavy setting.

Since this year the majority of the starfish set early in the season, largely between July 1 and 15, these predators have already grown to a comparatively large size and are, therefore, capable of considerable destruction. Because, in addition to this increase in population, the numbers of adult starfish existing prior to the spawning season were very large, the oyster industry of Connecticut is still facing the difficult problem of controlling these extremely numerous enemies.

Progress in Development of Chemical Control of Shellfish Enemies: Last week we met with representatives of the Food and Drug Administration to discuss various aspects of our method for control of shellfish enemies and ascertain what steps are needed to clear this method for the industry's use. Representatives of Food and Drug are apparently satisfied with our methods for analysis of chlorinated benzenes and Sevin, the substances that constitute our formula. Moreover, on the basis of our analyses of the selected samples we were able to show the experts that no chemical residue is found in meats of clams and oysters collected (120 days after treatment) from lots which were treated with 3 to 5 yards of sand-Polystream-Sevin mixture. Many samples collected from the same lots after periods shorter than 120 days were also free of any traces of the chemicals.

Regardless of the extremely gratifying results obtained so far, it has been decided that we will analyze an additional series of samples before forming final conclusions. This series of analyses is now in progress and we hope that within several months we shall finally be able to offer the industry an extremely effective and commercially-feasible method for

control of drills and other enemies. (Bulletin No. 5, September 19, 1962.)

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MARYLAND OBSERVATIONS ON SPAWNING AND SETTING AS OF SEPTEMBER 18, 1962:

Late summer weather remained dry with salinities above normal. Temperatures were a little below the seasonal average and resulted in better mixing of the upper layers of water so that oxygen poor or "stagnant" water conditions generally were confined to greater depths than usual for the time of year. No marked cooling of the water had occurred and water temperatures for mid-September were near the normal of about 75° F. for September 17 at Solomons, according to the September 18 "Special Oyster Bulletin" of the Maryland State Chesapeake Biological Laboratory, Solomons.

The fungus *Dermocystidium* continued to infect oysters to a greater extent than usual in areas from Solomons down through the saltier waters of the bay area. Peak losses from the parasite occur during late summer and through September. The extent of the losses had not yet been measured but may be high among crowded and old oysters in high salinity areas. Recovery occurs when the water cools.

This year's set of spat do not become infected by the parasite even in areas where infestation by fungus is heavy. *Dermocystidium* losses do not occur until after the first year of the oyster's life and for this reason young spat can be safely moved without danger of losses from this cause.

No further increase in the extent of the light MSX infection of Maryland oysters had been recorded this season.

Oyster Setting: Oysters continued to set at a favorable rate and at most stations a substantial spat fall had been received on test shells.

Reports from various sources indicate that good sets were common on commercially-planted shell although official counts will not be made until setting has ended and spat are large enough to be easily recognized by the naked eye.

* * * * *

POOR CROP OF JAMES RIVER SEED OYSTERS PREDICTED AFTER SETTING FAILURE:

Oyster spat have failed to set this year in the James River seed beds in Virginia. This indicates a failure in the oyster reproduction cycle in the James River because young oysters or spat set (attach themselves to dead shell) soon after hatching. The Virginia Institute of Marine Science examined many oyster seed beds in the James River. Only Wreck Shoal showed a few spat. Bags and strings of test shells on Wreck Shoal showed an average of less than one-half spat per shell for the usually important period from mid-August to mid-September. The setting season ends about the first of October. The usual count for a setting season is from 5 to 15 spat per shell.

In 1961, oyster setting in the James River was light so the failure this year is a crisis for James River public oyster beds. James River seed stock normally has at least three year-classes of oysters—current year spat, yearling, and 2-year-old oysters. But in the coming 1962/63 season only 2-year-olds and a few yearlings will be available as seed. In the following season the shortage will be even more apparent.

The most valuable seed oysters are spats and yearlings with a high count per bushel. The value of this year's seed stock will therefore be reduced and yields per bushel planted will be lower. The full advantage of younger year-classes could have been obtained in the low-salinity areas where most of this year's crop will be planted. In low-salinity areas the drills that prey on young oysters are absent. Only low-salinity areas are in production now because of the MSX disease or blight.

The hooked mussel, a fouling organism which seriously reduces the quality of seed oysters, is dying in some areas of the seed beds, although they may continue to be a problem.

The causes of spat failure in James River cannot be clearly defined. Two factors may be involved. First, oysters in the extensive planting areas of Hampton Roads, Va., which may contribute spawn to the James River seed area, are now decimated by the MSX epidemic. Second, the very wet years, 1960-61, may have contributed to the very poor oysters which were typical of James River in the spring of 1962. This may have had an effect on spawning. There is no reason to suspect that weather conditions in 1962 were unfavorable to reproduction and larval survival since moderate sets were obtained in other areas of Chesapeake Bay where spat falls are often failures. For example, a set occurred in September 1962 on Hampton Bar below the seed area.

The Virginia Institute of Marine Science, Gloucester Point, Va., attempts to record setting success each year in as many areas of Virginia as possible. But there are so many creeks and rivers in Virginia that all cannot be covered by the Institute. The Institute would appreciate reports from oystermen of good sets for 1962 in any small creeks, particularly in the James River and Hampton Roads area. (Virginia Institute of Marine Science, Gloucester Point, Va., September 24, 1962.)



Pollution

NEW LABORATORY TO STUDY SALT-WATER QUALITY STANDARDS:

A new laboratory (costing \$1.7 million) for salt-water pollution research is to be established in Kingston, R. I., announced the U. S. Public Health Service on October 1, 1962. Water quality standards for all marine water uses, including aquatic life, wildlife, industrial, agricultural, recreational, and

other uses, are to be developed by the U. S. Public Health Service at the new laboratory.

The Kingston Laboratory will conduct scientific studies on measures to be taken to protect the public from infectious biological and other toxic pollutants. It will also investigate the effects of pollution on aquatic life, establish criteria for radioactive wastes and other pollutants, and determine the effects of distribution of pollutants by water currents in bays and harbors.

The full laboratory staff will comprise about 100 persons, of whom about 75 will be scientists in the fields of marine and estuarine biology, microbiology, chemistry, physics, radiology, oceanography, and engineering.

Aside from its location on Narragansett Bay, Kingston was chosen as the site for the new laboratory largely because of scientific activities in the Marine Services School of the University of Rhode Island there, the Northeast Shellfish Sanitation Laboratory, and a new University Oceanographic Laboratory to be established in the area later.

* * * * *

NEW LABORATORY TO STUDY FRESH-WATER QUALITY STANDARDS:

A fresh-water quality standards laboratory is to be established at Duluth, Minn., according to an announcement by the U. S. Public Health Service on October 8, 1962. The total cost of the project, including construction and equipment, will be \$2.3 million. Water quality standards for all fresh water uses, including domestic water supply, aquatic life, wildlife, industrial, agricultural, and other uses, are to be developed at the new laboratory, which will be operated by the U. S. Public Health Service.

The new laboratory will conduct scientific studies of measures to be taken to protect the public from infectious biological and other toxic pollutants. It will also investigate the effects of pollution on aquatic life, and establish criteria for radioactive wastes and other pollutants. In carrying out its research program, the laboratory aims to provide reliable methods for detecting and measuring the effects of pollutants on water quality, particularly those resulting from new technologies for which such methods do not now exist.

The new laboratory will employ about 130 persons, some 90 of whom will be scientists, chemists, microbiologists, physicists, biologists, engineers, and other laboratory personnel.

The location of the laboratory at Duluth, Minn., on Lake Superior, is in an area surrounded by clean fresh-water streams which are well suited to the development of the program's basic procedures. The location has the added advantage of being close to the University of Minnesota (Duluth Campus), which has been conducting extensive studies of the biology of streams and lakes. It is also near the Oliver Research Laboratory of the U. S. Steel Corporation, and Wisconsin State College in Superior, Wis.

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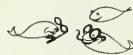
SCIENTIFIC VESSEL CONDUCTS WATER POLLUTION CONTROL RESEARCH IN LAKE MICHIGAN:

The most fully-equipped scientific vessel, the Maurice F. Fitzgerald, used exclusively for water pollution control research is now operating on Lake Michigan, according to an October 9, 1962, announcement by the U. S. Public Health Service. The vessel will operate around-the-clock to determine sources of water pollution, mainly in the lower area of Lake Michigan for a period of four months. It is under contract from an oceanographic firm in Annapolis, Md.

The scientific work the vessel will do is part of a series of comprehensive water pollution control programs that the Public Service's Division of Water Supply and Pollution Control is conducting in the Great Lakes and Illinois Waterways, and in the basins of the Columbia River, Chesapeake Bay-Susquehanna River, Delaware River, and upper Ohio and Columbia Rivers. Comprehensive planning to provide systematic, orderly water-quality management in all of the country's river basins is expected to be completed by 1970 which has been set as the completion date goal for the program. The antipollution study of all the Great Lakes will take about seven years.

The Maurice F. Fitzgerald is 83 feet long, 16 feet wide, and can berth a crew of 6, and also accommodate a scientific team of 6 persons with all necessary instruments. The vessel will be cruising constantly, weather permitting, to locate and fix water pollution

control sampling stations. Many analyses will be made in the vessel's special laboratories, such as biological, bacteriological, and chemical determinations of lake waters, as well as biological analyses of the lake bottom. It will also participate in the project's study of Lake Michigan's water currents.



Refrigerated Sea Water

REFRIGERATED SEA WATER TANK INSTALLED IN OCEAN PERCH FISHING VESSEL:

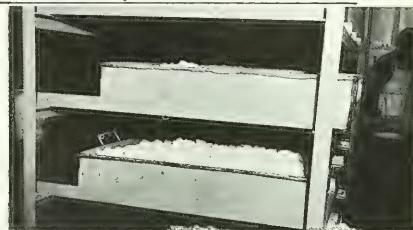
An experimental refrigerated-sea-water tank designed to hold approximately 3,000 pounds of fish was recently installed aboard a commercial fishing vessel (Judith Lee Rose) engaged in the ocean perch fishery out of Gloucester, Mass. The tank is equipped with a compressor, circulating pump, and a thermocouple wire lining in the fish hold located at the stern section of the vessel. The tank was installed as an experiment under a research program on refrigerated sea water conducted by the U. S. Bureau of Commercial Fisheries Technological Laboratory at Gloucester.

Data on operation of the tank and quality of the fish are to be collected by the Bureau's technologists during several of the vessel's trips, and then evaluated to determine whether fish stored in refrigerated sea water are of better quality than ice-stored fish. If the experiment on the ocean perch vessel proves successful, efforts are to be made for the permanent installation of such tanks in this, and other fishing vessels.



Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS, SEPTEMBER 1962:



In a fishery plant in Bayou La Batre, Ala., cooked peeled and deveined shrimp are held in pans stacked in a rack.

United States Shrimp Supply Indicators, September 1962					
Item and Period	1962	1961	1960	1959	1958
..... (1,000 Lbs., Heads-Off).					
Total Landings, So. Atl. and Gulf States:					
November	-	9,996	14,454	12,412	12,416
October	-	12,696	21,690	19,601	16,462
September	12,700	9,691	18,832	18,331	15,847
January-August ..	56,241	52,474	78,962	71,599	63,728
January-December ..	-	91,395	141,035	130,660	116,552
Quantity canned, Gulf States 1/:					
November	-	2,215	1,614	2,312	3,424
October	-	2,307	2,567	2,531	3,489
September	1,700	785	2,236	2,108	2,825
January-August ..	13,064	9,653	21,200	16,450	14,723
January-December ..	-	15,763	28,594	24,679	26,404
Frozen inventories (as of end of each mo.) 2/:					
November 30	-	20,668	37,264	37,334	30,211
October 31	-	17,811	31,209	33,057	24,620
September 30	4/	13,361	24,492	26,119	18,079
August 31	12,754	12,728	20,171	23,780	15,274
July 31	13,677	14,849	17,397	22,352	12,351
June 30	13,904	19,416	15,338	19,283	10,664
January 31	21,328	37,842	34,332	30,858	17,963
Imports 3/:					
November	-	14,852	13,516	10,269	10,617
October	-	16,813	14,211	15,340	11,463
September	4/	8,629	8,190	7,541	7,620
August	7,381	6,743	6,406	5,107	6,628
January-July	72,266	63,803	58,684	57,687	38,618
January-December	-	126,268	113,418	106,555	85,394

1/Pounds of headless shrimp determined by multiplying the number of standard cases by .33.
2/Raw heads only; excludes breaded, peeled and deveined, etc.
3/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.
4/Not available.

Note: Data for 1962 and 1961 are preliminary. September 1962 data estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.



South Atlantic

Exploratory Fishery Program

ROYAL-RED SHRIMP AND CALICO SCALLOP EXPLORATIONS OFF FLORIDA'S EAST COAST:

M/V "Silver Bay" Cruise 41 (August 22-September 8, 1962): To obtain seasonal and geographical coverage of royal-red shrimp (*Hymenopenaeus robustus*) and the Canaveral or calico scallop (*Pecten gibbus*) were the objectives of this cruise by the exploratory fishing vessel Silver Bay of the U.S. Bureau of Commercial Fisheries. The vessel operated on the Continental Shelf along the east coast of Florida from Fort Pierce to Jacksonville during the 18-day cruise, and returned to its base at Brunswick, Ga., on September 8, 1962.

A total of 143 stations were completed which included the use of 70-foot flat trawls, 60- and 40-foot 2 seam trawls, 8-foot tumbler dredge, and a 25-foot scallop trawl. The

problem of badly twisted bridles experienced on previous cruises was reduced by attaching the trawls to the back side instead of the back edge of the boards. That procedure increased the spreading force of the boards and also maintained a greater lateral spread of the bridles.

On the royal-red shrimp grounds, 36 exploratory drags were made with catches ranging up to 400 pounds of 36-40 shrimp (heads-on) during a 3-hour drag. Depths ranged from 100 to 210 fathoms. Exceptionally strong tides of up to 5 knots, and low bottom temperature (47° F.) at times prevailed. These were possibly caused by a passing tropical disturbance which may have been responsible for the light catches.

During the scallop exploration, a total of 95 stations were completed with a 25-foot scallop trawl and an 8-foot tumbler dredge fitted with a $2\frac{1}{2}$ inch nylon liner.

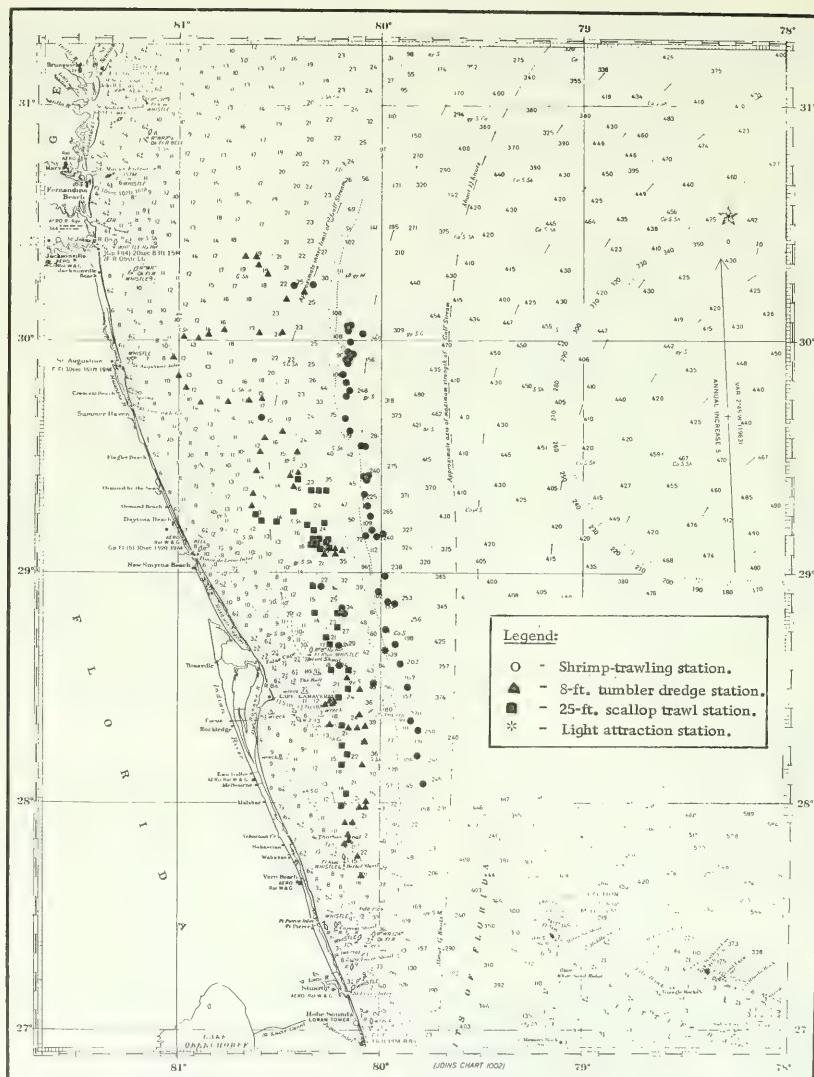
The lowest catch rates occurred between Cape Canaveral and Fort Pierce. Although dead scallop shells compromised over 90 percent of some of the catches, thousands of small scallops in the 20-25 millimeter (0.8-1 inch) size were observed. This was taken as evidence of a new crop coming into the area. Samples from 14 stations were preserved for the Bureau of Commercial Fisheries Shellfish Laboratory at Gulf Breeze, Fla., to assist in their studies of the species.

East of Cape Canaveral and north to Jacksonville, scallops were caught in commercial quantities at various stations. Catches ranged up to 14 bushels of calico scallops (45-50 millimeters or 1.8-2 inches) per 30-minute drag. Scallop meat yields ranged from 91 to 61 meats per pint.

At one of the stations worked by the Silver Bay, 8 bushels of large (60-65 millimeters or 2.4-2.6 inches) calico scallops were caught in $17\frac{1}{2}$ -19 fathoms, 36 miles, 95° (true), off St. John's River entrance. The yield there was 79 meats per pint. That station substantially extends the northern boundary of the Canaveral bed.

Fresh shell stock from the cruise was preserved and shipped to a Chicago firm who is working on the development of a shucking machine for calico scallops.

Scallop specimens were collected during operations at the trawling and dredging sta-



M/V Silver Bay Cruise 41 (Aug. 22 to Sept. 8, 1962).

tions and preserved by the Bureau of Commercial Fisheries Biological Laboratory at Brunswick for future study.

Note: See Commercial Fisheries Review, October 1962 p. 30.



South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, JULY-SEPTEMBER 1962:

The following is a report on the progress of biological research by the Bears Bluff Laboratories, Wadmalaw Island, S. C., for July-September 1962:

Oyster Research: Most of the Laboratories' efforts during the third quarter of 1962 were directed toward helping the State's Division of Commercial Fisheries survey oyster bottoms for leases. In addition, some data were collected on the value of solite as a substitute cultch.

Shrimp Research: Regular station plankton tows made during the quarter showed that recruitment of postlarval white shrimp was largely over by late August. The post-larvae had begun entering coastal sounds and rivers in late May and reached peak abundance during the last week in June. The postlarvae were slightly more plentiful this year than in 1961, indicating that the commercial catch of white shrimp may be somewhat of an improvement over last year.

Brown shrimp were much more abundant during July-September this year as compared with 1961. Experimental plankton tows earlier this year had indicated that the post-larvae were over five times as numerous in sounds and rivers during 1962, and this has been reflected in the commercial catch this season, which has been greatly increased over last year's. Experimental trawling during the quarter revealed that brown shrimp were three times more plentiful at regular survey stations, located throughout the coastal waters of the State, than during July-September 1961.

Catch-per-unit-of-effort data from experimental trawl hauls also indicated that croakers increased in abundance in 1962. During the quarter alone, croakers were approximately 50 percent more plentiful than during the same period of last year. Catch data for spot, on the other hand,

showed little difference in the abundance of those fish during the two periods.

White shrimp were slightly less abundant in experimental trawl catches during July-September 1962 as compared with that quarter of 1961, but the differences in abundance is hardly significant and this condition may be reversed during the next quarter.

A detailed study of croakers is being carried on this year and was continued throughout the quarter. The aims of the study are to determine the abundance, growth rates, and distribution of croakers in South Carolina waters. It is hoped that the study may also yield information concerning the relative importance of the State as a nursery area for those fish. Although croakers never reach a large size, the young are found in tremendous quantities in coastal sounds and rivers, and it is thought that perhaps those fish migrate along the coast and enter the commercial catch of other states.

Pond Cultivation: Several pond-cultivation experiments were begun in July 1962, and were still under way at the end of the quarter. Two one-acre ponds are used to compare the advantages or disadvantages of natural flooding as a means of stocking to stocking by hand. Both of the ponds were drained in late June, cleaned out, and allowed to refill with water from the nearby creek. No effort was made to screen out fish, crabs, etc. in the pond which was to be stocked naturally by flooding, and the gates of the pond were allowed to remain open for approximately one month, during which time postlarval white shrimp were most abundant in nearby waters. This pond was then closed and treated with 1.5 parts per million of rotenone to remove predatory fishes.

The other pond in the experiment was screened after draining and allowed to refill, then was closed off. The pond was then stocked with approximately 8,000 juvenile shrimp which were collected by means of cast nets from nearby creeks. The pond was also treated with rotenone to remove fish. Crab pots were used in both ponds involved in the experiment to remove crabs and scrap fish. Chopped crabs have been placed in the ponds several times each week as shrimp forage. These experiments were to be ended sometime in October or November, at which time both ponds are to be drained and harvested.

Two one-quarter-acre ponds were stocked with fingerling mullet in July 1962. This experiment is being conducted to determine the productivity and growth rates of mullet in salt-water ponds. A small one-tenth-acre pond has been stocked with postlarval shrimp from plankton tows in an effort to determine the feasibility of this method of stocking shrimp ponds.

Note: See Commercial Fisheries Review, September 1962 p. 40.



Standards

VOLUNTARY STANDARDS AND INSPECTION PROGRAM FOR FISHERY PRODUCTS:

Two new fishery products standards, one for frozen fried scallops and the other for flounder and sole fillets, were developed by the U. S. Bureau of Commercial Fisheries during the past year. This brings the total of USDI (United States Department of the Interior) quality standards for fishery products now available for use by the fishing industry to 12. Technical assistance was also provided by the Bureau in the development of a Federal specification for frozen raw breaded shrimp and three fishery product specifications for use by State Purchasing Officials. Standards and specifications for fishery products are tools by which the industry and other interested parties can measure product quality. The consumer therefore benefits because such standards and specifications tend to raise the quality level of the product.

A significant change in the Bureau's Inspection and Certification Service regulations became effective June 1, 1962. Under the new regulations, all fees for continuous inspection services are based on a uniform rate per hour. The new regulations also provide for other incidental changes, including a clarification of fees for lot inspection services. The changes will achieve a higher degree of uniformity in the assessment of fees and methods of charging, eliminate variations between processing plants, and provide more flexibility to the Bureau in operating the program.

Over 160 million pounds of various fishery products were produced under continuous inspection and certified by the Bureau during 1961. An additional 25 million pounds

of fishery products were sampled, examined, and certified on a lot basis.

On a national basis, the Bureau of Commercial Fisheries now provides continuous or lot inspection services in 17 different states requiring a work force of 52 trained supervisors and inspectors.



Transportation

SELECTED OCEAN FREIGHT RATES
FOR CERTAIN FISHERY PRODUCTS:

Table 1 - Ocean Freight Rates for Selected Fishery Products from Certain African Ports to the United States

Shipping Ports by Countries	Canned Spiny Lobsters	Canned Fish Other than Spiny Lobsters	Products	Frozen Spiny Tails	Frozen Fish in Bulk	Dried Salt Fish
South-West Africa: Walvis Bay Luderitz } So. Africa Republic: Cape Town Port Elizabeth } East London Durban }	36.00	24.25	(US\$/Freight Ton)	76.00	-	-
Mozambique: Lourenco Marques Beira } Kenya Mombasa }	32.00	24.25	70.00	79.00W	51.25	
Tanganyika: Dar-Es-Salaam }	35.50	27.75	73.50	-	-	
Zanzibar }	35.50	27.75	73.50	-	-	

Note: Rates are based on freight tons of weight or measurement (2,240 pounds or 40 cubic feet of space), whichever produces the greatest revenue; except that whenever "W" is shown after a rate, the rates apply per ton weight.

Table 2 - Ocean Freight Rates for Canned Sardines (Pilchards) and Canned Mackerel from Cape Town or Walvis Bay, South Africa δ , to Selected Far Eastern and South American Ports

Ports of Destination by Countries	Ocean Freight Rate
Philippine Islands:	US\$/40 Cubic Feet ^{2/}
Manila	18.33
New Zealand:	
Wellington	35.00
Ecuador:	
Guayaquil	50.00

¹² The South African Fish Cannery Association quotes all prices c.i.f., Cape Town. If the actual freight rate from Walvis Bay varies from the Cape Town rate, the Walvis Bay canneries absorb the difference.

Walvis Bay varies from the Cape Town rate, the Walvis Bay canners absorb the difference 2/- per ton of 40 cubic feet.

3) Approximate rate.

{United States Consulate, Cape Town, report of September 21, 1962.



Tung

PRODUCTION AND MARKETING PROBLEMS DISCUSSED AT SECOND JAPAN-UNITED STATES CONFERENCE

The second Japan-United States tuna conference took place October 9-13, 1962, in

Tokyo for the purpose of exchanging views and information on various problems concerning production and marketing of tuna and tuna products which have occurred since 1959 to date.

Conference established two committees in which experts of the two delegations took part.

In Committee 1, the current trend in tuna production and forecast for tuna resources, expanded utilization of tuna fisheries, and measures for improving exchange of information were discussed. With respect to tuna resources, biological and oceanographic information was given and information concerning research programs and administrative measures was freely exchanged. There was an exchange of information on various studies related to expanding uses of tuna.

In Committee 2, the current trends and outlook for tuna market and tuna trade problems were discussed. With respect to tuna market, the current trend was reviewed and consumption, by types of product, by region, and by consumer characteristics was discussed. Information on government programs to develop demand for tuna was exchanged and review of present tuna trade situation was made.

The two committees submitted their reports to the plenary session which approved them on final day of conference.

The two delegations agreed that the conference was a success and very helpful to governments and tuna industries of both countries by providing an opportunity for frank exchange of views and information.

* * * * *

PROPOSED JAPANESE-UNITED STATES TUNA VENTURE IN CALIFORNIA:

Reportedly a California tuna vessel association has proposed a joint Japanese-American tuna venture in San Diego, Calif. But prospects for the venture do not appear to be hopeful, reports the Japanese periodical Shin Suisan Shimbun Sokuho of October 4, 1962. This opinion is based on the fact that there have been cases in the past where Japanese participation in this type of venture involving cold-storage plants have ended in failure.

The proposed tuna venture reportedly involves a capital investment of US\$2 million, to be raised equally between the Japanese and United States participants, and is said to include construction of a cold-storage plant in San Diego.

* * * * *

BUREAU OF COMMERCIAL FISHERIES TUNA FORECASTING AND BEHAVIOR PROGRAMS:

Tuna Forecasting Program: A tuna-tagging and blood-sampling project was completed by the chartered tuna seiner West Point when she returned to San Diego on August 23, 1962. The vessel was chartered by the U. S. Bureau of Commercial Fisheries San Diego Biological Laboratory for a 30-day cruise under this program. The latter part of the trip was devoted to joint bluefin tagging operations with the California Department of Fish and Game. A total of 960 bluefin were tagged in the Guadalupe and San Clemente Island area.

In addition to the tagging project, blood samples were taken from 200 bluefin for type analysis in a cooperative program with the Bureau's Biological Laboratory at Honolulu, Hawaii.

In order to determine the feasibility of spotting albacore and bluefin tuna schools from naval aircraft, three flights were made in P2V-type aircraft. The flights were also part of a survey, under this program, to determine the possibilities of charting, from aircraft, specific oceanographic features such as water color. Additional flights were scheduled in September as a continuation of the tuna spotting and oceanographic investigations.

Tuna Behavior Program: Studies on tuna behavior off Socorro Island and Cape San Lucas were completed by the chartered vessel Red Rooster on August 13, 1962. The vessel was chartered by the Bureau's San Diego Biological Laboratory under the Tuna Behavior Program. The Red Rooster worked jointly with both the West Point and the spotting aircraft during the cruise.



U. S. Fishing Vessels

FISHERIES LOAN FUND AND OTHER FINANCIAL AID FOR VESSELS, JULY 1-SEPTEMBER 30, 1962:

From the beginning of the program in 1956 through September 30, 1962, a total of 1,193 loan applications for \$33,490,467 were received by the U. S. Bureau of Commercial Fisheries, the agency administering the Federal Fisheries Loan Fund. Of the total, 630 applications (\$14,872,849) have been approved, 413 (\$10,923,399) have been declined or found ineligible, 129 (\$5,738,022) have been withdrawn by applicants before being processed, and 21 (\$318,260) are pending. Of the applications approved, 253 (\$1,617,937) were approved for amounts less than applied for.

The following fishery loans were approved from July 1, 1962, through September 30, 1962:

North and Middle Atlantic Area: Lester R. Savage, Boothbay Harbor, Me., \$5,000; Wild Duck, Inc., Gloucester, Mass., \$47,400; Kaare Gjertsen, Point Pleasant, N. J., \$40,000; Donald A. McClelland, Point Pleasant, N. J., \$24,000.

South Atlantic and Gulf Area: Arthur I. Tormala, Fort Myers, Fla., \$24,000; Edward Crittenden, Orlando, Fla., \$11,732; John Smircich, Freeport, Tex., \$18,691.

California: Byron T. Anderson, Eureka, \$22,000; David L. Rankin, Trinidad, \$3,500.

Pacific Northwest Area: Boat Trinity & Owners, Seattle, Wash., \$23,000; Charles H. Sheridan, South Bellingham, Wash., \$3,215.

Alaska: Charles O. Tubbs, Juneau \$4,000.

Under the Fishing Vessel Mortgage Insurance Program (also administered by the Bureau) during the third quarter of 1962, commitments to insure mortgages in the amount of \$165,750 on 2 fishing vessels were approved for the Explorer Fishing Corp., New Bedford, Mass. Since the start of this program (June 5, 1960), 12 applications were received for \$1,402,346. Of the total, 11 applications covering 23 vessels have been approved for \$1,485,596. Approval of 3 applications for \$385,000 is pending.

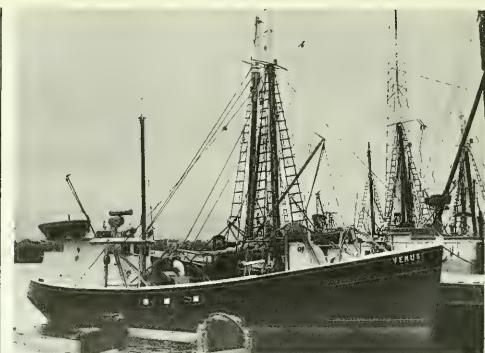
In the Construction Differential Subsidy Program, one application for \$4,000 was received during the third quarter of 1962. No construction differential subsidies were approved during the quarter. The first approval in this program was made in March 1961. The amount approved for subsidy represents one-third the cost of a new vessel. Since the beginning of the program on June 12, 1960, 11 applications were received for \$703,313, of which 5 applications were approved for \$507,646. Approval of 3 applications for \$90,667 under this program is pending. Three applications from ineligible fisheries were disapproved since the start of the program.

Note: See *Commercial Fisheries Review*, Aug. 1962 p. 40.

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FIRST FISHING VESSEL CONSTRUCTION WITH AID OF GOVERNMENT SUBSIDY:

The first fishing vessel in the nation to be completed with Federal subsidy fishing vessel construction funds under Public Law 86-516 was documented for fishing on October 10, 1962, at New Bedford, Mass. The 73-foot wooden otter trawler *Venus* was issued official number 289369 by the U. S. Bureau of Customs at New Bedford. The U. S. Bureau of Commercial Fisheries further aided in the construction of the vessel by a mortgage insurance guarantee.



Fishing vessel *Venus* built with aid of Federal Government fishing vessel construction subsidy funds.

The *Venus* was built in about six months at the Gamage Shipyard in South Bristol, Maine. The owner of the new trawler, Thomas B. Larsen, New Bedford, planned to commence fishing for groundfish in October.

As of October, four other fishing vessels were under construction with the aid of subsidy funds--two 134-foot steel trawlers were being built for Boston owners, one 95-foot wooden trawler for a New Bedford owner, and one 100-foot wooden trawler for a Rockland, Maine, owner. In addition, 2 applications for subsidy aid were being processed at that time.

Fishing vessel construction has been at a low ebb for several years in New England. The Bureau's Fishing Vessel Construction Subsidy Program should help to revive vessel construction. Already several shipyards from Maine to New Jersey have shown an interest in the program.



U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, JULY 1962:

Imports of fresh, frozen and processed edible fish and shellfish into the United States in July 1962 were up 23.6 percent in quantity and 10.1 percent in value as compared with the previous month. Imports were much greater in July for fish blocks and slabs (increase mostly from Canada, Iceland, and Norway) and frozen tuna (increase mostly from Peru, British West Pacific Islands, Japan, and Ecuador). Imports were also up for groundfish fillets (increase mostly from Canada and Iceland), sea catfish fillets, fresh and frozen salmon (mostly from Canada), canned salmon (increase from Japan), canned tuna in brine other than albacore (mostly from Japan), fresh swordfish (from Canada), canned crab meat (mostly from Japan), canned oysters (mostly from Ja-

pan), and frozen frog legs (mostly from Japan). But imports dropped sharply for canned sardines not in oil (decline mostly from South Africa), and imports were also down for canned sardines in oil, canned albacore tuna in brine (mostly from Japan), flounder fillets (mostly from Canada), frozen swordfish fillets (mostly from Japan), fresh lobsters (from Canada), frozen shrimp, and sea scallops (mostly from Canada).

Compared with the same month in 1961, the imports in July 1962 were up 22.2 percent in quantity and 31.1 percent in value. There was a large increase this July in imports of frozen tuna (increase mostly from Peru, British West Pacific Islands, and Japan) and fish blocks and slabs (increase mostly from Canada, Iceland, and Norway). Other products imported in greater quantity this July were groundfish fillets other than haddock, fresh and frozen salmon, canned tuna in brine other than albacore, fresh swordfish, canned crab meat, canned oysters, frozen spiny lobster tails (increase mostly from Australia and South Africa), frozen shrimp, sea scallops, and frozen frog legs. The increases were partly offset by a sharp drop in imports of canned sardines not in oil (decline mostly from South Africa), as well as a decline in imports of haddock fillets, flounder fillets, sea catfish fillets, frozen swordfish fillets, canned salmon (decline mostly from Japan), canned sardines in oil, and fresh lobsters from Canada.

The first seven months of 1962, imports were up 15.8 percent in quantity and 24.5 percent in value as compared to the same period in 1961. The greater increase in value was because of the higher prices which prevailed this year for most imported fishery products. Most fishery products were imported in greater quantity this year and imports were up substantially for fish blocks or slabs (increase mostly from Norway), canned salmon (mostly from Canada and Japan), frozen tuna (increase mostly from Japan and Peru), canned tuna (mostly from Japan), canned sardines in oil, frozen shrimp, and sea scallops. Imports were down for the following products: cod fillets, haddock fillets, fresh and frozen salmon (mostly from Canada), canned bonito and yellowtail, canned sardines not in oil, canned oysters (mostly from Japan), and frozen frog legs.

United States exports of processed fish and shellfish in July 1962 were up 40.0 percent in quantity and 25.0 percent in value as compared with July 1961. Exports were up for canned salmon, canned squid (increase mostly to Greece), canned sardines not in oil, and canned mackerel (increase mostly to El Salvador). The table below does not include data on fresh and frozen exports, but exports of frozen shrimp in July 1962 showed a sharp drop due to a decline in the amount exported to Japan. Exports of frozen salmon were down also.

U. S. Imports and Exports of Edible Fishery Products, July 1962 with Comparisons									
Item	Quantity				Value				
	July	Jan.-July	1962	1961	July	Jan.-July	1962	1961	
Imports:			(Millions of Lbs.)				(Millions of \$)		
Fish & Shellfish:									
Fresh, frozen & processed ¹ /	104.0	85.1	663.9	573.5	35.0	26.7	226.3	181.8	
Exports:									
Fish & Shellfish:									
Processed only ¹ / (excluding fresh & frozen)	1.2	1.5	19.5	14.4	1.0	0.8	7.9	7.4	

¹/Includes pastes, sauces, clam chowder and juice, and other specialties.

Compared with the previous month, the exports in July 1962 were down 34.4 percent in quantity, but the value of the exports in July 1962 was equal to the value in the previous month. There was a sharp drop in exports of lower-priced products such as canned squid (principally to Greece and the Philippines) and canned sardines not in oil. But exports were up for canned shrimp (principally to Canada and the United Kingdom), and canned mackerel. Although not covered in the table below, exports were up for frozen salmon (principally to France and Canada), but down for frozen shrimp (decline mostly in exports to Japan).

Processed fish and shellfish exports for the first seven months of 1962 were up 35.4 percent in quantity, but the value was up only 6.8 percent as compared with the same period of 1961. Exports of canned squid (principally to Greece and the Philippines) showed the greatest increase in 1962. Exports were also up for canned mackerel, canned salmon, and canned sardines not in oil. But exports were down for canned shrimp (decline mostly in exports to Canada). Although not covered in the table, exports were up for frozen salmon, and were down for frozen shrimp (decline mostly in exports to Japan) and shucked oysters (principally to Canada). Source: United States Foreign Trade (Trade by Commodity), Summary Report FT 930-E, July 1962, U.S. Department of Commerce.

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EDIBLE FISHERY PRODUCTS, AUGUST 1962:

Imports of fresh, frozen, and processed edible fish and shellfish into the United States in August 1962 were down 1.3 percent in quantity and 7.1 percent in value as compared with the previous month. There were sizable declines in August imports of blocks and slabs (declines mainly from Iceland and Norway), groundfish fillets other than haddock (decline mostly from Canada), flounder fillets (mostly from Canada), canned salmon (mostly from Canada and Japan), canned tuna in brine (decline mostly from Japan and Ecuador), northern lobsters from Canada, frozen spiny lobsters, frozen shrimp, and sea scallops (mostly from Canada). The declines were almost offset by a sharp increase in imports of frozen tuna (increase mainly from Japan and Ecuador), fresh and frozen salmon (mostly from Canada), and canned sardines not in oil (increase mostly from South Africa Republic), as well as more modest increases in imports of halibut and salmon fillets (mostly from Canada), swordfish fillets (mostly from Japan), yellow pike fillets (mostly from Canada), fresh swordfish (mostly from Canada), and canned crab meat (mostly from Japan).

Compared with the same month in 1961, the imports in August 1962 were up 16.6 percent in quantity and 13.2 percent in value. There was a large increase this August in imports of frozen tuna (increase mostly from Peru, Ecuador, and Japan). Imports also increased this August for fish blocks and slabs (increase mostly from Norway, Greenland, and Iceland), cod fillets, halibut and salmon fillets, sea catfish fillets, fresh and frozen salmon, canned sardines not in oil (increase mostly from South Africa Republic), canned oysters (mostly from Japan), northern lobsters, frozen spiny lobsters, frozen shrimp, and frozen frog legs (mostly from Japan). But imports were down for groundfish fillets other than cod fillets, flounder fillets, canned salmon, canned tuna in brine, canned sardines in oil, fresh swordfish, canned crab meat, and sea scallops.

In the first eight months of 1962, imports were up 15.9 percent in quantity and 22.8 percent in value as compared with the same period in 1961. The greater increase in value was because of the higher prices which prevailed this year for most imported fishery products. Most fishery products were imported in greater quantity this year and imports were up substantially for fish blocks or slabs (increase mostly from Nor-

U. S. Imports and Exports of Edible Fishery Products, August 1962 with Comparisons									
Item	Quantity				Value				
	Aug.	Jan.-Aug.	1962	1961	Aug.	Jan.-Aug.	1962	1961	
Imports:			(Millions of Lbs.)				(Millions of \$)		
Fish & Shellfish:									
Fresh, frozen & processed ¹ /	102.7	88.1	766.6	661.6	32.5	28.7	258.8	210.5	
Exports:									
Fish & Shellfish:									
Processed only ¹ / (excluding fresh & frozen)	1.7	1.7	21.2	16.1	0.9	0.9	8.8	8.3	

¹/Includes pastes, sauces, clam chowder and juice, and other specialties.

way), canned salmon (mostly from Canada and Japan), frozen tuna (increase mostly from Japan and Peru), canned tuna other than albacore (mostly from Japan), canned sardines in oil, frozen shrimp, frozen spiny lobsters, and sea scallops. Imports were down for the following products: cod fillets, haddock fillets, fresh and frozen salmon (mostly from Canada), canned bonito and yellowtail, canned albacore tuna in brine, canned sardines not in oil, canned oysters (mostly from Japan), and fresh swordfish (mostly from Canada).

The quantity and the value of United States exports of processed fish and shellfish in August 1962 were the same as in August 1961. Exports were up in August 1962 for canned salmon, canned sardines not in oil, and canned squid. But the increase was offset by a decline in exports of canned mackerel and canned shrimp (mostly to Canada and the United Kingdom).

Compared with the previous month, the exports in August 1962 were down 19.0 percent in quantity and 10.0 percent in value. Exports were down for canned mackerel, canned salmon, canned shrimp, and canned squid (decline mostly in shipments to Greece and the Philippines). The decline was partly offset by increased exports of canned sardines not in oil.

Processed fish and shellfish exports for the first eight months of 1962 were up 31.7 percent in quantity, but the value was up only 6.0 percent as compared with the same period of 1961. Exports of canned squid (principally to Greece and the Philippines) showed the greatest increase in 1962. Exports were also up for canned mackerel, canned salmon, and canned sardines not in oil. But exports were down for canned shrimp (decline mostly in exports to Canada and the United Kingdom). Although not covered in the table, exports were up for frozen salmon, and were down for frozen shrimp (decline mostly in exports to Japan) and shucked oysters (principally to Canada).

Sources: United States Foreign Trade (Trade by Commodity), Summary Report FT 930-E, August 1962, U. S. Department of Commerce.

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AIRBORNE IMPORTS OF FISHERY PRODUCTS:

January-May 1962: Shrimp was the leading U. S. airborne fishery import during the first part of 1962. Shrimp accounted for 74.1 percent of the quantity and 79.8 percent of the value of airborne imports of fishery products in May 1962. All of the U. S. airborne shrimp imports during the first five months of 1962 originated in Central and South American countries. The leading suppliers of airborne shrimp imports during January-May 1962 were Venezuela with 38.0 percent of the total, Nicaragua with 27.6 percent of the total, and Panama with 17.7 percent of the total.

Other than shrimp, fish fillets from Mexico and live northern lobsters from Canada were the most important airborne imports in May 1962. The airborne imports in May 1962 also included fresh salmon from Canada, spiny lobster tails from Guatemala, fresh and frozen spiny lobsters other than tails from Guatemala and Jamaica, turtles from Colombia, and sturgeon roe from Rumania. The data as issued do not show the state of all products--fresh, frozen, or canned--but it is believed that the bulk of these airborne imports is fresh and frozen products.

U. S. Airborne Imports of Fishery Products, January-May 1962				
Product and Origin ¹ /	May		Jan.-May	
	Qty. ² /	Value ³ /	Qty. ² /	Value ³ /
Pounds	US\$	Pounds	US\$	
Fish:				
Canada	7,144	4,660	8,144	5,028
Mexico	121,963	27,297	275,025	53,373
France	-	-	155	463
Rumania	1,151	10,290	1,251	11,287
Panama	-	-	7,807	1,312
Total Fish . . .	130,258	42,247	292,382	71,463
Shrimp:				
Guatemala	32,081	18,227	98,149	52,312
El Salvador	82,362	61,655	208,106	146,376
Nicaragua	111,808	39,887	715,351	241,498
Costa Rica	41,332	18,190	93,743	39,435
Panama	73,785	35,833	457,853	230,393
Venezuela	120,165	54,515	986,012	470,410
Ecuador	-	-	12,210	3,440
Mexico	12,743	4,069	18,815	7,919
Netherlands Antilles	-	-	3,075	2,722
Total Shrimp	474,276	232,396	2,593,314	1,194,505
Shellfish Other Than Shrimp:				
British Honduras	3,880	1,160	65,764	39,710
Honduras	-	-	60,203	47,706
Costa Rica	-	-	1,400	1,247
Panama	-	-	1,040	1,011
Jamaica	1,826	780	30,014	21,324
Netherlands Antilles	-	-	14,159	9,264
Venezuela	-	-	22,263	13,624
Mexico	-	-	27,793	16,050
Guatemala	5,000	2,000	7,370	3,880
Leeward and Windward Islands	2,451	1,016	17,274	6,217
Nicaragua	-	-	390	281
Japan	-	-	26	330
France	174	518	324	937
Colombia	1,187	2,990	1,327	3,226
Ecuador	-	-	940	704
Canada	20,723	7,820	20,723	7,820
Total Shellfish (exc. shrimp) . . .	35,241	16,284	271,010	173,331
Grand Total	639,775	290,927	3,156,706	1,439,299

¹When the country of origin is not known, the country of shipment is shown.

²Gross weight of shipments, including the weight of containers, wrappings, crates, and moisture content.

³F.o.b. point of shipment. Does not include U. S. import duties, air freight, or insurance.

Note: These data are included in the over-all import figures for total imports; i.e., these imports are not to be added to other import data published.

Source: United States Airborne General Imports of Merchandise, FT 380, May 1962, U. S. Department of Commerce.

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January-June 1962: Airborne fishery imports into the United States and Puerto Rico in June 1962 increased 35.9 percent in quantity and 42.4 percent in value over the previous month. The increase was due mainly to larger shipments of shrimp and live northern lobsters. In June, airborne shrimp imports of 615,485 pounds entered through the U. S. Customs Districts of Florida, New Orleans (La.), Laredo (Tex.), and Los Angeles (Calif.). Airborne imports of live northern

lobsters from Canada amounted to 147,758 pounds and entered through the U. S. Customs Districts of Massachusetts and New York City. Other airborne imports to the United States mainland in June included fish fillets from Mexico, fresh salmon from Canada, spiny lobster tails from British Honduras and El Salvador, and fresh crab meat from Mexico. Puerto Rico's airborne fishery imports in June consisted of 5,509 pounds of live spiny lobsters from Caribbean countries.

Shrimp accounted for 79.7 percent of the quantity and 81.8 percent of the value of air-

borne imports of fishery products in the first half of 1962. All of the U. S. airborne shrimp imports during the first six months of 1962 originated in Central and South American countries. The leading suppliers of airborne shrimp imports in January-June 1962 were Venezuela with 36.3 percent of the total, Nicaragua with 24.7 percent, and Panama with 21.1 percent.

The data as issued do not show the state of all products--fresh, frozen, or canned--but it is believed that the bulk of these airborne imports is fresh and frozen products.



Virginia

STUDY EFFECTS OF MAN-MADE WASTES ON MARINE ANIMALS:

The effects of man-made contaminants on marine animals will be studied by the Virginia Institute of Marine Science, Gloucester Point, Va., under a \$33,300 research grant awarded recently by the Division of Water Supply and Pollution Control of the U. S. Public Health Service. The Institute Director stated that the two-year investigation will be under the direction of the head of the Ecology-Pollution Research Department.

The project will determine the effects of continuous exposure of marine animals to low concentrations of poisonous materials, such as insecticides, herbicides, and domestic and industrial wastes. These are materials known to be discharged into the marine system at present, and will be increased as our population and economy grows in future years, thus posing a threat to marine life.

Safe levels of contaminants may change as the salinity and temperature of the waters change. Animals that are not directly killed by toxic substances may be weakened, exposing them to the onslaughts of predators and diseases, or hindering their reproduction. It is also possible that one link in the food chain may be destroyed resulting in the starvation of all animals dependent upon that link for food.

"We cannot expect to have positively pure waters in areas heavily populated by man," reported the Director. "We can, however, intelligently use our natural resources, and this requires research and planning. The

U. S. ^{1/} Airborne Imports of Fishery Products, January-June 1962					
Product and Origin ^{2/}	June		Jan.-June		
	Qty. ^{3/}	Value ^{4/}	Qty. ^{3/}	Value ^{4/}	
Fish:		Pounds	US\$	Pounds	US\$
Canada.....	13,173	11,920	21,317	16,948	
Mexico.....	75,225	10,765	350,250	64,138	
France.....	-	-	155	463	
Rumania.....	-	-	1,251	11,287	
Panama.....	-	-	7,807	1,312	
Norway.....	223	449	223	449	
Total Fish.....	88,621	23,134	381,003	94,597	
Shrimp:					
Guatemala.....	25,154	11,250	123,303	63,562	
El Salvador.....	54,300	31,032	262,406	177,408	
Nicaragua.....	76,127	26,754	791,478	268,252	
Costa Rica.....	54,944	25,455	148,687	64,890	
Panama.....	220,803	114,085	678,656	344,478	
Venezuela.....	178,224	111,940	1,164,236	582,350	
Ecuador.....	-	-	12,210	3,440	
Mexico.....	5,933	1,133	24,748	9,052	
Neth. Ant.....	-	-	3,075	2,722	
Total Shrimp....	615,485	321,649	3,208,799	1,516,154	
Shellfish Other Than Shrimp:					
British Honduras ..	9,576	3,154	75,340	42,864	
Honduras.....	-	-	60,203	47,706	
Costa Rica.....	-	-	1,400	1,247	
Panama.....	-	-	1,040	1,011	
Jamaica.....	-	-	30,014	21,324	
Neth.Ant.....	1,099	486	15,258	9,750	
Venezuela.....	-	-	22,263	13,624	
Mexico.....	1,806	985	29,599	17,035	
Guatemala.....	-	-	7,370	3,880	
Leeward and Wind- ward Islands	2,072	861	19,346	7,078	
Nicaragua.....	-	-	390	281	
Japan.....	-	-	26	330	
France.....	-	-	324	937	
Colombia.....	95	400	1,422	3,626	
Ecuador.....	-	-	940	704	
Canada.....	147,758	62,320	168,481	70,140	
El Salvador.....	495	242	495	242	
Trinidad.....	2,338	971	2,338	971	
Total Shellfish (exc. shrimp).....	165,239	69,419	436,249	242,750	
Grand Total.....	869,345	414,202	4,026,051	1,853,501	

^{1/}Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. But United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.

^{2/}When the country of origin is not known, the country of shipment is shown.

^{3/}Net weight of shipments, including the weight of containers, wrappings, crates, and mounts.

^{4/}F.o.b. point of shipment. Does not include U. S. import duties, air freight, or insurance.

Notes: These data are included in the over-all import figures for total imports; i.e., these imports are not to be added to other import data published.

Sources: United States Airborne General Imports of Merchandise, FT 380, June 1962, U. S. Department of Commerce.

results of this project will aid those responsible for planning in making decisions on the amounts of contaminating materials that can be discharged into our waters without harming marine life. Our problem today is to determine these damaging effects before contamination levels become great enough to cause harm!"

State and Federal agencies are rapidly accumulating data for predicting industrial and population levels in the years 1975 and 2000. This information will assist in actions to protect our nation's water resources.



Wholesale Prices

EDIBLE FISH AND SHELLFISH, SEPTEMBER 1962:

From August to September 1962 there was a slight drop in the wholesale price index for edible fishery products (fresh, frozen, and canned). The September index at 119.8 percent of the 1957-59 average was down 1.5 percent from the previous month, but rose 8.6 percent from September 1961. This September's declines in the subgroup indexes for drawn, dressed, or whole finfish, and canned fishery products were offset by increases in the other subgroups.

There were significant decreases from August to September in several fresh drawn and dressed fish products which caused a 5-percent decrease in that subgroup. These included fresh large haddock (ex-vessel price at Boston down 28.9 percent) and fresh or frozen halibut (wholesale price at New York down 8.9 percent). The September average wholesale price at New York City for fresh or frozen dressed king salmon was almost unchanged from the previous month, but was 25 percent higher than a year earlier. The fractional drop in the index for dressed king salmon resulted from slightly lower prices for the frozen product as the season for fresh salmon came to an end. Prices were higher at Chicago for fresh Lake Superior whitefish (up 25.6 percent), and at New York City for Great Lakes yellow pike (up 12 percent). Compared with the same month in 1961, the subgroup index this September was 18.7 percent higher. Prices were higher for all products in the subgroup, except yellow pike at New York City (down 6.7 percent).



Fig. 1 - Barrels and boxes of fish at wholesalers' stands in the "new shed" of the salt-water section of Fulton Fish Market, New York City.

The index for the processed fresh fish and shellfish subgroup this September rose 4.7 percent from August and was up 10.5 percent from September 1961. As in August, fresh shrimp prices at New York City (up 9.7 percent) were responsible for the increase. The demand for shrimp continued good and market conditions were strong in September. Although there were some indications of a price drop for shrimp towards the end of the month, the drop in imports from Mexico because of the tie-up of that country's west coast fleet reversed the trend and prices firmed up again. Prices for fresh haddock fillets at Boston were lower (down 4 percent) than in August despite some decline in the September landings of small haddock. The new season for fresh shucked oysters started in September. Prices at Norfolk of \$7.50 a gallon were the same as in September 1961, and remained unchanged since April 1962. When compared with September 1961, the subgroup index this September was up 10.5 percent because of higher prices for fresh haddock fillets (up 14.5 percent) and fresh shrimp at New York City (up 20.2 percent).



Fig. 2 - Deveining shrimp in a fishery plant located in Tampa, Fla.

The processed frozen fish and shellfish subgroup index this September increased 4.2 percent from the previous month and jumped 19.5 percent from September 1961. From August to September, prices were higher for frozen shrimp at Chicago (up 6.5 percent) and for ocean perch fillets at Boston (increased 4.9 percent). The frozen shrimp market continued strong during September at even higher prices than in August. Erratic frozen shrimp prices at Chicago for a brief period in September did not change the firm over-all market tone that prevailed throughout the month. As compared with September 1961, prices for all fillets in the subgroup averaged 4 percent higher. Frozen shrimp prices at Chicago were up 29.9 percent from September a year earlier.

In the canned fish subgroup, a weakening trend was indicated for all major products because of heavier seasonal packs. From August through September the subgroup index dropped 6.1 percent and declined 4 percent from September 1961. Prices this September were lower for canned pink salmon (down 10.6 percent), canned tuna (down 3.3 percent), and canned Maine sardines (down 2.1 percent). The canned tuna pack at the end of September was considerably ahead of the same period a year ago, and well ahead of the record 1959 pack for the same period. But canned tuna prices this September were still 2.3 percent higher than a year earlier; in August they were higher than the previous year by 10.4 percent. The new pack of canned Maine sardines at 1.8 million standard cases as of September 22, was nearly 4 times greater than in the same period of 1961. Prices for canned Maine sardines this September were 11.6 percent lower than at the same time last year. Through September very few California sardines had been packed because there were practically no significant landings.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, September 1962 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes 2/ (1957-59=100)			
			Sept. 1962	Aug. 1962	Sept. 1962	Aug. 1962	July 1962	Sept. 3/1961
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					119.8	121.6	119.0	110.3
Fresh & Frozen Fishery Products:					125.6	124.3	118.5	107.9
Drawn, Dressed, or Whole Fishish:					125.0	131.6	123.3	105.3
Haddock, Ige., offshore, drawn, fresh	Boston	lb.	.10	.14	78.1	109.8	98.6	73.4
Halibut, West., 20/30 lbs., drsd., fresh or froz .	New York	lb.	.43	.47	126.6	138.3	130.0	115.4
Salmon, King, Ige., & med., drsd., fresh or froz .	New York	lb.	1.05	1.05	146.3	146.7	136.2	117.0
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.66	.53	98.5	78.4	89.5	78.4
Yellow pike, L. Michigan & Huron, rnd., fresh .	New York	lb.	.56	.50	91.7	81.9	77.8	88.3
Processed, Fresh (Fish & Shellfish):					123.1	117.6	113.4	111.4
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.36	.37	86.2	89.8	94.7	75.3
Shrimp, Ige., (26-30 count), headless, fresh	New York	lb.	1.07	.98	125.4	114.3	105.5	104.3
Oysters, shucked, standards	Norfolk	gal.	7.50	7.50	126.5	126.5	126.5	126.5
Processed, Frozen (Fish & Shellfish):					122.8	117.8	113.3	102.8
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.40	100.1	100.1	98.9	97.6
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.35	.35	101.1	101.1	98.2	96.7
Ocean perch, Ige., skins on 1-lb. pkg.	Boston	lb.	.32	.30	110.4	105.2	103.4	105.1
Shrimp, Ige., (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	1.15	1.08	136.4	128.1	122.2	105.0
Canned Fishery Products:					110.2	117.4	120.1	114.8
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	25.50	28.50	111.1	124.2	124.2	122.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.75	12.15	104.4	107.9	107.9	102.1
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	5.25	5.25	118.5	118.5	118.5	107.2
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	9.11	9.31	116.9	119.4	145.1	122.2

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/Beginning with January 1962 indexes, the reference base of 1947-49=100 was superseded by the new reference base of 1957-59=100.

3/Recomputed to be comparable to 1957-59=100 base indexes.



ARCTIC RESEARCH REVEALS LITTLE MARINE LIFE

The Fisheries Research Board of Canada in the spring of 1961 sponsored research of the frozen wastes of Canada's far north where the seas lie forever bound by polar ice. A scientist from the Board's Pacific Oceanographic Group at Nanaimo, B. C., was the only fisheries representative on a scientific team which carried out specialized studies on the Prince Gustaf Adolph Sea, in an area roughly 600 miles from the North Pole. The precise interest of the fisheries scientist were to determine the physical and chemical properties of sub-ice seas and to gain information on the living creatures found in them.

Forms of marine life are limited on the polar region. No fish was taken although many different methods were used in an effort to do so. Plankton hauls to depths of 400 feet were not too productive. However, they yielded quantities of shrimp-like organisms in similar magnitude to winter sampling in certain areas of the North Pacific Ocean where water temperature conditions are vastly different.

Many important contributions to the fields of oceanography and biology of arctic seas were made through the party's observations on the Prince Gustaf Adolph Sea. These observations required sustained effort under the most trying and hazardous of conditions. (Trade News, September 1962, of Canada's Department of Fisheries.)



International

TUNA

U. S. INTERIOR DEPARTMENT OFFICIALS PARTICIPATE IN UNITED STATES-JAPAN CONFERENCE IN TOKYO:

Frank P. Briggs, Assistant Secretary of the Interior for Fish and Wildlife, and Philip H. Trezise, Deputy Assistant Secretary of State for Economic Affairs, were cochairmen of the United States delegation to the United States-Japan Tuna Conference in Tokyo, Japan, October 9-13, 1962.

The conference was to be an official intergovernmental meeting of experts on essentially technical matters to exchange information and views on certain aspects of the conservation, production, processing, and marketing of tuna by the United States and Japan. Greater understanding and mutual benefits are expected from this bilateral exchange and discussion of current information on such matters as tuna fisheries, trends in tuna production, conservation and utilization of tuna resources, market trends, and expanded international trade of tuna.

The Tokyo meeting was first suggested last May 16 by Ichiro Kono, Japan's Minister of Agriculture, Fisheries, and Forestry, when he visited the United States and met Secretary of the Interior Stewart L. Udall. A similar conference was held in Tokyo in September 1959. Tuna fishery operations since have expanded even more around the globe, and because Japan and the United States are the two most prominent tuna-producing nations in the world, Minister Kono proposed that another conference on tuna would be most appropriate and helpful. Secretary Udall had indicated to Minister Kono that the Department of the Interior would generally be interested in such a meeting. Plans for the conference were developed by both countries.

Members of the United States delegation attending the Tokyo conference included 9 other Government representatives and 11 industry advisers.

GENERAL AGREEMENT ON TARIFFS AND TRADE

EFFECTS OF NONTARIFF MEASURES ON FISHERY TRADE STUDIED:

A study to determine the use and effects of nontariff measures in support or protection of agriculture or fishery production and trade was conducted by Committee II of the General Agreement on Tariffs and Trade (GATT). The reports resulting from the study contain the Committee's general findings and conclusions on the use and effects of support and protection measures on international trade.

The Committee consulted with 39 GATT member countries about their policies. Of the 39 member countries, 34 of them had important fisheries. With the experience and information gained from those consultations, the Committee has published its second and third reports. Pertinent portions of the report concerning fisheries follow:

Nontariff Measures: Of the 34 countries examined by the Committee, all but 6 had some form of nontariff devices affecting trade in fish and fishery products. There are wide differences from country to country in the use of nontariff measures, and some of the measures examined are either not in use or of no practical importance, as for instance mixing regulations and State-trading.

Consumer's subsidies and arrangements for the disposal of surpluses are in use in some countries. The predominant and important devices applied are various forms of income and price support including government subsidies, import levies and quantitative restrictions on imports. Of the 34 countries examined, 17 of them practice income

International (Contd.):

and price support systems of various kinds, and of those countries, 12 give direct governmental financial support to the fishing industry.

In most of those countries subsidies, either as grants or as loans at preferential interest rates, are given in connection with the building of new fishing vessels and in order to improve generally the fishing gear and equipment. Governmental guaranteed minimum price systems in many cases also involve subsidies. A few countries give subsidies directly to the fishermen to improve their incomes.

Grants and loans given to the fishing industry for improving the equipment and the guaranteed minimum price systems are arrangements which are usually in operation over a long period of time, as a part of the fishing policy pursued by the country. Direct subsidy schemes are often of a more limited character based on special circumstances such as sudden and heavy decreases in catches of certain products or sudden drops in market prices.

Quantitative restrictions are applied by 25 of the 34 countries. In some countries, quantitative restrictions are directed against imports from certain countries or areas. Other countries impose restrictions on all or most imports of fish and fishery products. Only 13 of the 25 countries stated that quantitative restrictions are imposed for balance-of-payment reasons. Quantitative restrictions appear to be an integral part of the protective systems in force in many countries and have no longer any connection with the balance-of-payment position. Seventeen of the countries examined have GATT tariff bindings on all or some categories of fish imports; many of those countries maintain some form of nontariff devices by which the benefit of the bindings is reduced or in some cases largely nullified. In addition, many of those countries aim at self-sufficiency or a high degree of self-sufficiency.

Effects of Nontariff Measures: There is a general feeling that the widespread nontariff measures applied by the various countries, especially such measures as public financial assistance, and quantitative restrictions affect production, consumption, and prices in international trade in fish and

fishery products. The lack of expansion of trade must to a large extent be attributed to those measures, which in most cases seem to be especially designed as part of the fishery policies pursued by countries.

In countries where quantitative restrictions are in use, the measures constitute a barrier to the development of the trade for fishery products against which they are directed, in this way protecting the producers from import competition and insulating them from fluctuations in world market prices.

Income and price support, including governmental subsidies, grants and loans at preferential rates, may in the long run have adverse effects on the fishing industry if the financial support leads to overfishing in certain waters.

Nontariff measures will, in one way or another, tend to restrain structural changes and natural development in production and to impede the free development of competition in international trade.

The increase in production is not reflected in a corresponding increase in human consumption. Removal of the existing barriers to trade would lead to an increase in the consumption of edible fish products, especially in the field of frozen products. The great inland areas in the world, where fish supplies until now have been scarce or nonexistent should be potential markets for large quantities of fish, especially frozen fish, when "cold chains" are sufficiently established.

The national fishery policies pursued create great problems for the traditional exporting countries and, in particular, for those countries whose national economies depend heavily upon fisheries. Furthermore, the measures applied cannot be said to have solved adequately the economic problems confronting the fisheries of other countries.

Many of the countries examined have GATT tariff bindings on fish imports. Many of those countries maintain some form of nontariff device which reduces the benefits of the bindings and, in some cases, largely nullifies them. Certain of those countries are important fish consumers. The Committee noted that the impairment of bindings was obviously of great significance to the fish exporting countries. The Committee took note that a positive assurance of access to the markets

International (Contd.):

of the countries with whom tariff concessions were negotiated is regarded as essential by some exporting countries if they are to be able to participate effectively in tariff negotiations."

Notes: (1) A copy of the 50-page report (GATT Program for Expansion of International Trade, Trade in Agriculture Products, Second and Third Reports of Committee II) may be obtained from the Sales Agent for GATT Publications, International Documents Service, Columbia University Press, 2960 Broadway, New York 27, New York. The price is \$1.00.

(2) See Commercial Fisheries Review, June 1962 p. 1.

EUROPEAN FREE TRADE ASSOCIATION

NORWAY CUTS TARIFFS ON IMPORTS FROM OTHER EFTA COUNTRIES:

Norway's tariffs on imports from six other European Free Trade Association (EFTA) countries were cut from 70 percent to 60 percent effective September 1, 1962. Norway has also agreed to make a further 10 percent reduction not later than April 30, 1963. Five of the

Outer Seven countries reduced their import tariffs from 70 percent to 60 percent in March 1962. Another 10-percent cut was to be made by those 5 countries on October 31, 1962.



The second 10-percent cut in October 1962 by the other EFTA countries was effected much earlier than originally planned, and will mean a total 50 percent tariff slash since the EFTA agreement was signed. The Norwegian tariff cuts had been postponed with approval of the EFTA Ministerial Council. (News of Norway, August 30, 1962, of the Norwegian Information Service.)

Note: See Commercial Fisheries Review, August 1962 p. 51.

FOOD AND AGRICULTURE ORGANIZATION

FISHING METHODS AND GEAR SEMINAR AND STUDY TOUR IN U.S.S.R.:

Representatives from Asian and African countries participated in a seminar and study tour on fishing methods and fishing gear technology, held in the Union of Soviet Socialist Republics August 18 through September 28, 1962. The seminar-study tour was sponsored by the Food and Agriculture Organization

(FAO) at the invitation of, and in cooperation with the U. S. S. R. Government.

The Prospectus for the Seminar-Study Tour as outlined by FAO follows:

Background and Objectives: The participants in the seminar and study tour will be fisheries officers charged with developing fishing industries in their home countries which are now at various levels of development. All are familiar with the general techniques of fishing. Most of the countries are tropical or subtropical and the emphasis will be on warm-water fishing, mainly with small and medium size mechanized craft ranging from 25-100 feet, but with some briefing on fishing with bigger vessels.



During the seminar, the entire field of fishing methods and gear technology will be covered as far as time permits, but with major emphasis on basic subjects such as materials, rational design and construction of fishing gear, fishing theory including tactics of fish finding and attraction of fish, as well as a general briefing on various methods of fishing and discussion of their relative suitability under various conditions. Several of those subjects will be covered more thoroughly in the course of the study tour where fishing operations can be observed and analyzed critically.

Major emphasis will be on the methods of main importance in the home countries of the participants, such as long-lining and gill-netting (bottom-set and drifting), trawling in shallow water for fish and shrimp, warm-water fishing for tuna, scomberoids, etc., and fishing with various types of traps, haul seines, encircling nets and purse seines.

The proposed seminar study tour has been planned with those objectives in view so that the group of participants from countries in Asia and Africa eligible for technical assistance might discuss their respective problems with each other, and with an experienced group of subject-matter specialists, against a background of a highly advanced and varied fishing industry and gear technology research and development activity.

International (Contd.):

PROGRAM

I SEMINAR

Fisheries specialists from the U.S.S.R. and FAO will deliver a number of lectures and lead a series of discussions under the following main headings:

1. Materials of Fishing Gear:

- 1.1 Terminology and numbering systems.
- 1.2 Characteristics of net materials and methods of testing these.
- 1.3 Relative efficiencies of gear made of different materials.
- 1.4 Preservation and maintenance of gear.

2. Net Making:

- 2.1 Mechanized knitting of webbing.
- 2.2 Knotless nets.
- 2.3 Cutting and joining of machine-made webbing.
- 2.4 Framing and hanging of nets.

3. Rational Design of Fishing Gear:

- 3.1 Engineering theory and experiments with models.
- 3.2 Measuring instruments and underwater observation.
- 3.3 Selectivity; comparative fishing experiments.
- 3.4 Specifying shape, dimensions, materials of gear.

4. Operation of Fishing Gear:

- 4.1 Types and choice of fishing gear (with emphasis on warm-water fishing) with small and medium sized craft; special lectures on gill-netting and long-lining, purse-seining, trawling for shrimp and fish, tuna fishing.
- 4.2 Efficient handling of fishing gear.
- 4.3 Efficiency in handling of catch.
- 4.4 Fish processing on board craft.
- 4.5 Choice of type and size of boat in relation to methods of fishing, distance to grounds, etc.

5. Strategy and Tactics of Fishing:

- 5.1 Location of fish.
- 5.2 Detection of fish.
- 5.3 Attraction of fish.
- 5.4 Electrical fishing.

6. Training of Fishermen and Gear Technologists:7. U.S.S.R. Fisheries:

- 7.1 Review of U.S.S.R. fishing industry.
- 7.2 Organization of the fisheries.
- 7.3 The role of research in the development of fisheries.

These lectures will be conducted mainly in Moscow during the period August 18-31. Additional lectures and discussion periods will be arranged during the Study Tour of the Caspian and Black Sea fisheries.

II DEMONSTRATIONS

During the period devoted to the Seminar, a number of visits will be arranged to fishery institutions and places of interest in and near Moscow. These will include: the Institute of Marine Fisheries and Oceanography, VNIRO, including the Fishing Technique Laboratory, a net making plant, etc.

III STUDY TOURCaspian Fisheries, Based at Astrakhan:

1. Visit to CaspNIRO technological institute.
2. Lectures on U.S.S.R. fishing gear with demonstration of models.
3. Visit to fisheries cooperative, inspection of boats and sea trip to observe trap fishing.
4. Visit to net making plant.
5. Visit to processing plant.
6. Visit to Fisheries Training School.
7. Lectures on pump fishing with light attraction.

Pump Fishing with Light Attraction, Based at Baku:

1. Sea trip to observe pump fishing in the Caspian.

Black Sea Fisheries, Based at Yalta:

1. Inspection of big, modern factory trawler.
2. Sea trips - purse-seining, drifting, trawling.

Field Visits to Observe Fishing in Rivers, Lakes and Reservoirs:

During the period September 1-26, the participants will be conducted on a tour of fishing centers and fishery institutions in the Caspian and Black Sea area. They will have an opportunity to study the conduct of fishing operations with various types of equipment and methods, as well as the handling of the catch, technological and biological research activities, vocational training of fishermen, cooperative and collective fishing activities, and various ancillary undertakings associated with fishing. Frequent discussion periods will be arranged wherein the participants will have ample opportunity to discuss among themselves and with subject matter specialists from the U.S.S.R. and FAO, the equipment and methods observed and their applicability in the home countries of the participants.

The Seminar-Study Tour will close in Moscow on September 28.

Note: See Commercial Fisheries Review, October 1962 p. 2.

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RECOMMENDATIONS MADE AT WORLD SCIENTIFIC MEETING ON BIOLOGY OF SARDINES BEING CARRIED OUT:

At the World Scientific Meeting on the Biology of Sardines and Related Species (held in Rome, September 14-21, 1959), several recommendations were made proposing future action by the Food and Agriculture Organization (FAO).

International (Contd.):

In Supplement 1 of the report of the meeting, FAO describes the actions taken or proposed to take on the recommendations as follows:

I. The meeting recommended that FAO should publish an annotated bibliography of sardine research up to 1959. Such a bibliography is available for the years since 1957 in the Current Bibliography for Aquatic Sciences and Fisheries. References in the Current Bibliography to sardine research can be found by referring to the Taxonomic Indexes. FAO therefore proposes to concentrate on preparing a comprehensive bibliography for the years since 1931 when G. C. Wheeler's, A Bibliography of the Sardines (Fish. Bull., Sacramento 1931, vol. 36, 135 pp.), was published until 1956 inclusive, including Sardinella which is not covered in the Current Bibliography. FAO is contacting principal fisheries laboratories concerned with sardine research to see what material is already available. It is proposed that the bibliography will be compiled and issued during the 1962-63 FAO budgetary biennium.

II. It is proposed to publish in the FAO Fisheries Biology Branch Technical Papers Series, an indexed list of names and addresses of scientists concerned with sardine research according to a format which has already been established in other fields such as tuna research workers, algologists. The cooperation of research institutions will be sought in making such a list comprehensive and up-to-date. FAO expects to issue the list in 1962.

III. The need for follow-up meetings on the biology of sardines and on particular aspects of sardine research is expected. The desirability of holding such a meeting within 5 years of the first meeting, as was recommended, will be borne in mind, but FAO will have to consider relative priorities of such a meeting and of meetings on other species groups.

IV. The meeting recommended that similar meetings should be organized on other species for which major fisheries exist. This recommendation was implemented by plans for convening a World Scientific Meeting on the Biology of Tunas and Related Species, which was held in La Jolla, Calif., July 2-14, 1962.

V. The meeting recommended that FAO should continue to work for the standardiza-

tion of routine methods. It is proposed to effect this through contacts with regional fisheries councils and commissions or similar organizations, or where these do not exist, with national research organizations directly.

VI. It was recommended that conversion factors for length dimensions should be submitted by the various institutions to FAO. This has been done, and the data provided is summarized in a table included as table 2, Subject Synopsis 2, A Preliminary Comparative Study of the Growth, Maturity and Mortality of Sardines, by S. J. Holt, which is included in volume 2 of the Proceedings.

Note: See Commercial Fisheries Review, August 1962 p. 49; August 1959 p. 38; February 1959 p. 41.

INTERNATIONAL LABOR ORGANIZATION

WORK CONDITIONS OF COMMERCIAL FISHERMEN REVIEWED:

The secretariat of the International Labor Organization (ILO) is preparing several reports on employment conditions of commercial fishermen for submission to the Second Session of the Committee of Experts on Fishermen, which will be held in the latter part of 1962. The reports concern crew accommodation on board fishing vessels, safety on board fishing vessels, accident insurance of fishermen, and vocational training and certificates of competency.

In 1954, an International Labor Organization Committee of Experts on Fishermen met and recommended conventions concerning minimum age, medical examination, and articles of agreement for fishermen. The conventions were adopted by the 43rd conference of the International Labor Organization in 1959. The first two conventions, concerning minimum age and medical examination, have this year received a sufficient number of ratifications to enter into force.

The United States participated in previous deliberations of the Committee of Experts on Fishermen and plans to send representatives to this year's meeting.

Note: See Commercial Fisheries Review, Sept. 1959 p. 52.

UNESCO INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION

SECOND SESSION HELD IN PARIS:

The second session of the Intergovernmental Oceanographic Commission (IOC) convened in Paris, France, September 20-

International (Contd.):

28, 1962. The Commission was established by UNESCO in 1960 for the purpose of promoting coordinated scientific investigation with a view to learning more about the nature and resources of the oceans.

The session was attended by 5 United States representatives and six advisers.

There was general discussion at the second IOC session that other nations not now participating in the International Cooperative Investigation of the Tropical Atlantic (ICITA) program, might join. The delegate from Spain stated that his country was prepared to participate in that program. There was also considerable discussion that Japan might take part in it. Japan operates a number of fisheries research vessels in the tropical Atlantic which would tie in with one of ICITA's main objectives in developing the fisheries off Africa.

A resolution submitted by the United States delegation at the second IOC meeting was unanimously adopted by the Commission.

The resolution designates the Scientific Committee on Oceanic Research of the International Council of Scientific Unions as the advisory body to the Commission on the broad scientific aspects of oceanography. Also designates the Advisory Committee on Marine Resources Research of the Food and Agriculture Organization as the advisory body to the Commission on fisheries aspects of oceanography, the Committee being augmented for this purpose by two additional members from countries not members of FAO to be recommended by the Bureau of the Commission as invited by the Director-General of FAO in his letter of August 17, 1962. Taking into account the important activity of the U.S.S.R. in fisheries oceanography, it is recommended that the two additional members of this Committee be selected from scientists in this field of research in the U.S.S.R. Further, it requests the Bureau and the Secretary of the Commission to consult WMO, IAEA, and other appropriate intergovernmental and nongovernmental organizations of a world-wide and regional nature on international programs in oceanography.

The first session of the Intergovernmental Oceanographic Commission was held in Paris, October 19-27, 1961. At that meeting,

the Commission took the first steps to coordinate national and regional programs on oceanography and to establish the organizational mechanism, within the Commission, which could develop an integrated, well-coordinated international program in oceanography.

Note: See Commercial Fisheries Review, February 1962 p. 55.

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WORKING GROUP PLANS PROGRAMS FOR TROPICAL ATLANTIC INVESTIGATIONS:

The proposal for an oceanography-fishery investigation of the tropical Atlantic Ocean, submitted by the U. S. Bureau of Commercial Fisheries to the Interagency Committee on Oceanography (ICO), became a major international undertaking under the sponsorship of the Intergovernmental Oceanographic Commission (IOC).

An IOC Working Group met in Washington at the National Oceanographic Data Center June 20-23, 1962, to draw up plans for an International Cooperative Investigation of the tropical Atlantic. The Bureau's Biological Laboratory, Washington, D. C., with assistance from the National Oceanographic Data Center and the Navy Hydrographic Office, were responsible for the preliminary planning and arrangements for the meeting.

The opening session on June 20 was attended by some 60 persons, including representatives of 14 foreign countries. There was good representation from Universities on the east coast of the United States who have an interest in oceanography.

The purpose of the meeting was to plan in detail the working programs of the Tropical Atlantic Investigations, which are to start early in 1963. Also, to arrange for the exchange and publication of the resulting data, and the preparation and publication of an atlas.

The United States is to contribute seven ships to the investigation, representing the Bureau of Commercial Fisheries, Coast and Geodetic Survey, Woods Hole Oceanographic Institution, Texas A & M, and the Lamont Geological Observatory. Two fisheries research vessels and a large oceanographic vessel from the U.S.S.R. are to participate. Other ships will be from Argentina, Brazil, France, Ivory Coast, Nigeria, and the (former French) Congo.

The plans adopted at the Working Group meeting were to be presented at the Inter-

International (Contd.):

governmental Oceanographic Commission
September 1962 meeting in Paris.

Note: See *Commercial Fisheries Review*, August 1962 p. 56.

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**COORDINATION GROUP ON THE
INTERNATIONAL COOPERATIVE
INVESTIGATIONS OF THE
TROPICAL ATLANTIC MEETS:**

A meeting of the Coordination Group on the International Cooperative Investigations of the Tropical Atlantic (ICITA), a component of the UNESCO Intergovernmental Oceanographic Commission, was held in Paris, France, September 17-19, 1962. The purpose of the Group meeting was to coordinate the plans and programs of the various countries participating in the tropical Atlantic investigations.

The Paris meeting of the Coordination Group was recommended by the Working Group of the ICITA, which met in Washington, June 20-23, 1962.

FISH MEAL**WORLD PRODUCTION, JULY 1962:**

According to preliminary data from the International Association of Fish Meal Manufacturers, world production of fish meal in July 1962 amounted to about 227,533 metric tons, an increase of 11.5 percent over world production in July 1961.

Most of the principal countries producing fish meal submit data to the Association monthly (see table).

Country	World Fish Meal Production by Countries, July 1962		
	July 1962	Jan.-July 1961	1962
..... (Metric Tons)			
Canada	5,914	6,287	49,193
Denmark	11,700	8,010	50,570
France	1,100	1,100	7,700
German Federal Republic	7,196	6,229	43,317
Netherlands	-	500	2,400
Spain	2,117	2,116	15,829
Sweden	10	149	2,506
United Kingdom	7,287	6,813	44,935
United States	47,685	57,636	151,435
Angola	1,100	2,046	15,567
Iceland	19,094	18,133	51,424
Norway	36,494	24,730	67,178
Peru	65,716	44,933	610,158
South Africa (including South-West Africa)	22,120	25,300	180,316
Total	227,533	203,982	1,292,528

Note: Belgium, Chile, Japan, and Morocco do not report their fish meal production to the International Association of Fish Meal Manufacturers at present.

The increase in world fish meal production this July was mainly due to more output in Peru (up 46.3 percent), Norway (up 47.6 percent), and Denmark (up 45.1 percent). Norway's increase in production in July 1962 reversed the downward

trend in the previous two months. This year through July, Peru had increased landings of anchoveta and Denmark's landings of industrial fish were up. The increase was partly offset by a sizable drop in fish meal production in the United States (down 17.3 percent), South Africa (down 12.6 percent), and Angola (down 46.2 percent). The menhaden catch in the United States in July 1962 was 14.7 percent below the catch in July 1961.

Peru accounted for 28.9 percent of world fish meal production (for countries listed) in July 1962, followed by the United States with 20.9 percent, and Norway with 16.0 percent.

During the first seven months of 1962, Peru accounted for 47.2 percent of total fish meal production, followed by South Africa with 14.0 percent, and the United States with 11.7 percent.

**Belgium****JAPANESE CANNED TUNA PRICES,
MID-SEPTEMBER 1962:**

In mid-September, the average prices of Japanese canned tuna, c. & f. Antwerp were:

Yellowfin or Skipjack: Lightmeat, solid pack in cottonseed oil, Fancy A:	
48 7-oz. cans	\$7.42 a case
48 3½-oz. cans	\$4.40 a case
6 6½-oz. cans	\$8.75 a case
Dressed tuna with tomatoes:	
48 6½-oz. cans	\$6.70 a case

(United States Embassy, Antwerp, September 18, 1962.)

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FROZEN FISH MARKET:

Belgium is importing an increasing amount of frozen fish, and a domestic frozen fish industry has developed. The ready availability of fresh fish in Belgium has dampened the sale of frozen fish in the past. But the appearance of chain stores and supermarkets in recent years has helped change the pattern of consumer buying. Today a wide variety of frozen fish is available, including cod, haddock, whiting, bream, and plaice. Fish fillets are retailed in one-half and one-pound packages. Whole and gutted fish are packed in 2- to 15-pound packages. Frozen shellfish such as shrimp, spiny lobsters or crayfish, and scallops are also available in consumer packages.

The domestic frozen fish industry has a production capacity of 200 metric tons every 24 hours and a cold-storage capacity of about 1,200 cubic meters where fish can be stored at -25° to -30° C. (-13° to -22° F.). It also has a storage capacity of about 2,500 cubic meters where fish can be cooled at 0° to -1° C.

Belgium (Contd.):

(30.2° to 32° F.). Freezing is normally done at temperatures of -30° to -40° C. (-22° to -40° F.), depending on the type of fish.

Round fish are filleted by machine. The machines currently in use can handle 25 pieces a minute, which corresponds to four metric tons an hour for large fish and two tons for smaller varieties. Flatfish are filleted by hand.

Belgium's frozen fish industry has not yet reached full capacity. Because landings are irregular, prices vary and are often high. This affects the still hesitant consumer market and the industry in turn is reluctant to undertake maximum production. Some circles feel that increased production would stimulate consumption. Despite the uncertainty, an increasing quantity of frozen fish is being imported from neighboring countries and the struggle for the consumer market is becoming more and more severe.

The sale of consumer packs of frozen foods in Belgium is still handicapped by the large number of small retail stores which lack refrigerated food cabinets. Belgium has only 4,000 retail outlets equipped with refrigerated food cabinets, far less than several other European countries of comparable population. To encourage the use of frozen foods, some refrigerated cabinets are now being distributed to selected retailers at exceptionally advantageous terms. (Canadian Foreign Trade, September 8, 1962.)

**Brazil****FISHERIES TRENDS, AUGUST 1962:**

The new fishing port at Itajaí will be completed by September 1963. The new port costing 37.6 million cruzeiros (US\$82,728) will have cold-storage space for 150 metric tons of fish.

The Third National Meeting of Specialists in Sea Fishery Research was held August 20-24, 1962, at Florianopolis, Brazil. Fishery experts from all Brazil attended. (United States Consulate, Curitiba, September 10, 1962.)

**Canada****WEST COAST VESSELS ENTER TUNA FISHERY OFF SOUTHERN CALIFORNIA AND MEXICO:**

Two British Columbia purse-seiners (the Pacific Harvester and the Dominator) were diverted from the Canadian herring fishery and sent to tuna fishing grounds off California and Mexico in early July 1962. In a short time each vessel had caught a full load of about 100 tons of bluefin and albacore tuna. They unloaded their catch in Steveston, British Columbia, in August 1962. According to reports, the albacore tuna was to be canned in British Columbia, while the bluefin was to be sold to United States canners for processing.

The brine-spray freezing system installed on the purse-seiners by the Fisheries Research Board of Canada was described as an unqualified success. Tuna were frozen solid by the new freezing system and were delivered at Steveston in prime condition. (Facts on Fish, Fisheries Association of B. C., August 1962.)

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BRITISH COLUMBIA'S RECORD PACK OF CANNED PINK SALMON:

British Columbia packers had canned a record 1,179,369 standard cases of pink salmon by September 15, 1962, according to preliminary data from the Canadian Department of Fisheries. Pink salmon accounted for 67.6 percent of the total British Columbia canned salmon pack of 1,744,839 cases on September 15, 1962. The pack also included 289,972 cases of sockeye salmon, 149,782 cases of silver salmon, 107,940 cases of chum salmon, and 17,776 cases of miscellaneous species of salmon.

The British Columbia pack of sockeye salmon is heavily dependent on returns to the Fraser River system of the Adams River race of sockeye salmon. The International Pacific Salmon Fisheries Commission early this year predicted a low return of Adams River sockeye because the river flow was low when the yearling salmon entered the salt water in 1960. The returns bore out this prediction and the Commission was forced to restrict fishing severely to ensure an adequate escapement to the spawning grounds. This year's poor Adams River run of sockeye salmon was particularly disappointing because it was based on brood stock from the near-record return in 1958.

Canada (Contd.):

Returns of sockeye salmon to the Skeena River in the northern section of British Columbia were also light.

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GOVERNMENT LIBERALIZES FISHING VESSEL SUBSIDY REGULATIONS BY DROPPING VESSEL REPLACEMENT PROVISION:

The requirement that a steel fishing trawler built with the aid of a Government subsidy must replace a steel or wooden fishing vessel was not included in amended Ship Construction Assistance Regulations effected by Order-in-Council of the Canadian Government and published in the Canada Gazette, August 22, 1962. This means applicants no longer have to withdraw a steel or wooden fishing trawler from the fishing fleet in order to qualify for a capital subsidy toward the cost of building a new steel fishing trawler.

The new Regulations continue the capital subsidy for new steel fishing trawlers at the old rate of 50 percent of approved costs. The subsidy may be paid for the construction of new trawlers to be operated out of a port in any of the Provinces of New Brunswick, Newfoundland, Nova Scotia, Prince Edward Island, or Quebec. The subsidy will now be applicable only to vessels on which construction was begun after May 12, 1961. Trawlers built with the aid of a subsidy must have a steel hull and be at least 75 feet in length. The Regulations stipulate that shipowners who receive a subsidy must agree to undertake to retain the vessel on Canadian registry for a period of five years, and not to sell or transfer the vessel without the consent of the Canadian Maritime Commission and the approval of the Treasury Board.

Note: See Commercial Fisheries Review, Aug. 1961 p. 58.



Colombia

NATIONAL FISHING EXPOSITION TO BE HELD NOVEMBER 20-30, 1962:

The Colombian Second National Fishing Exposition and Second National Fishing Congress will be held in Bogota November 20-30, 1962, according to the Colombian Fishermen's Association and Fishing Industries. The Association is interested in having

United States firms display fishing equipment and supplies at the fair. They are also interested in United States investments in Colombia's fishing industry to help exploit their fish resources along both the Atlantic and Pacific Coasts. (United States Embassy, Bogota, September 17, 1962.)



Cuba

FISHING PORT TO BE BUILT BY SOVIETS:

Plans for the building of a major fishing port in Cuba by the Soviets were announced by the Prime Minister of Cuba on September 25, 1962. The port will be used as a base for the Soviet's Atlantic fishing fleet. The Prime Minister said the facilities will make unnecessary the trips Soviet trawlers now make to Eastern European ports for maintenance and overhaul.

A small fleet of Russian trawlers, equipped with refrigeration and electronic detection equipment, arrived this summer in Havana. It was reported that Soviet crews would instruct Cubans in the operation of the vessels and that the fleet ultimately would become the property of the Cuban Government. Earlier this year the Prime Minister said that Cubans would pay for the Soviet vessels by exporting fish to the Soviet Union. The Russians were to provide tinplate for canning the fish.

After signing of the contract by the Prime Minister and the Soviet Fisheries Minister, Cuba's Prime Minister appeared on television to make the announcement. He said the port will cost 12 million pesos (about US\$12 million at the 1960 rate of exchange). The location of the port was not announced.

The Soviet Union will pay for the cost of building the port through a "credit" to finance purchase of the machinery needed to operate the port. The Prime Minister stated that it will be built by Cuban laborers and material; Cuba will be compensated for this by additional food shipments from the Soviet Union. But the port will actually belong to Cuba and will be operated by Cuban workers, the Prime Minister said.

The port will be equipped with facilities for vessel repairs so that Soviet vessels will not have to return to Russia for periodic overhaul. The port would provide facilities for 115 to 130 medium trawlers. The port will

Cuba (Contd.):

be built and used by the Soviets under a 10-year contract. But the Prime Minister said the pact was a mere formality. "It surely will continue much longer than 10 years," he said.

Thus far the largest Cuban fleet is believed to operate out of the Las Villas Province town of Caibarien, on the north coast of central Cuba. The fishermen sail in locally-made 33-foot motor trawlers designed to hold a catch of about 1,000 pounds.

The prime Minister said the Cuban fishing fleet next year would comprise 5 Soviet vessels at present attached to the fleet but to be bought outright, 5 Japanese vessels due for delivery at the end of this year, 2 Polish vessels, and 50 75-foot vessels being built in Cuba.

He claimed that next year 110 75-foot vessels and 12 122-foot vessels to be built in Cuba would be added to this fleet.

Note: Cuban Government considers peso on par with U. S. dollar, but foreign exchange brokers in Miami give about 16 U. S. cents for a Cuban peso.

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**SOVIET-BLOC FISHERY
TECHNICIANS IN CUBA:**

A June 1962 research report issued by the Department of Fisheries of Cuba lists a Soviet technician on the staff of the Fish Technology Section. In addition, a specialist from East Germany is in the Cuban section of Resource Development.

**Denmark****FISH FILLETS AND BLOCKS AND
FISHERY INDUSTRIAL
PRODUCTS EXPORTS, JULY 1962:**

Denmark's exports of fresh and frozen fillets and blocks during the first seven months of this year were 17.4 percent greater than in the same period of 1961, mainly because of an increase of 163.9 percent in exports of herring fillets. Exports of flounder and sole fillets increased 13.4 percent, but exports of cod and related species declined 7.3 percent. During the first seven months of this year exports to the United States of fresh and frozen fillets and blocks of about 9,1 million pounds (mostly cod and related species) were up 2.3 percent from the exports of about 8,9 million pounds in the same period of 1961.

Denmark's exports of fresh and frozen fish fillets and blocks during July 1962 were 21.9 percent above exports in the same month in 1961. Of the total exports, about 0.7 mil-

lion pounds (mostly cod and related species) were shipped to the United States in July.

Product	Denmark's Exports of Fresh and Frozen Fish Fillets and Blocks and Fishery Industrial Products, July 1962 1/			
	July	Jan.-July		
	1962	1961	1962	1961
..... (1,000 Lbs.)				
Fillets and Blocks:				
Cod and related species	1,814	2,325	21,126	22,799
Flounder and sole	3,121	2,619	14,568	12,851
Herring	1,717	406	12,051	4,567
Other	28	128	447	828
Total	6,680	5,478	48,192	41,045
..... (Short Tons)				
Industrial Products:				
Fish meal, fish solubles, and similar products	7,221	4,737	39,131	26,784

^{1/}Shipments from the Faroe Islands and Greenland direct to foreign countries not included.

Denmark's exports of fish meal, fish solubles, and similar products in January-July 1962 were 46.1 percent greater than in the same seven months a year earlier.

During July 1962, Denmark's exports of fish meal, fish solubles, and similar products were 52.4 percent above the amount shipped out in the same month of 1961. The principal buyers were the United Kingdom and West Germany.

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**TO MANUFACTURE FOOD FOR
RAINBOW TROUT GROWERS:**

Food for rainbow trout, formerly imported by Denmark from the United States, will now be manufactured in that country. The fish food is used by the Danish pond trout industry, according to the United States Regional Fisheries Attaché. A group of Danish brook trout growers recently formed a share company, on a license basis, to make food for rainbow trout. The plant will be located in Herning, a small town in the trout-growing area of Jutland. It had not been decided whether to build, buy, or rent a factory, but the mid-Jutland site was chosen because it would be easier to ship the product to trout pond operators throughout that area. The chairman of the new enterprise is the owner of a trout farm having 250 ponds, and is also head of Danish Cooperative Trout Export. Shares in the new company amounting to 200,000 kroner (US\$29,000) already have been subscribed by trout pond operators, and the total investment in the firm is expected to be 500,000 kroner (\$72,400).

Denmark has imported about 500 metric tons of United States-produced trout food annually. When the new Danish



A pond trout enterprise in Denmark.

Denmark (Contd.):

company gets into full operation, the annual production will be about 10,000 tons, enough to cover two-thirds of the Danish demand for trout food. The price is expected to be cut in half from what it was formerly.

In May 1962, Danish trout-growers were successful in having the Folketing (Parliament) change a law permitting imports of fish food after furnishing the Ministry of Fisheries full information on its composition, but not requiring as was formerly the case, that the composition be disclosed to buyers of the product. The Danish pond trout industry wanted the law changed because the United States manufacturer of the fish food did not want to reveal the exact composition of his product for competitive reasons. The United States-produced fish food was found to be especially suitable in raising Danish rainbow trout.

Trout food is manufactured by a special process, and United States biologists have worked on its composition for 20 years. Attempts have been made in Denmark to put out a similar fish food, but the drawback was that it was not possible to analyze the composition of the product imported from the United States. The result was the purchase of rights from the United States firm to manufacture the product in Denmark. The owner of the United States firm was in Denmark this past summer to conclude the licensing negotiations which involved an advance payment of \$10,000, and a subsequent 6 percent royalty on all sales.

A large proportion of the 600 Danish trout pond operators already use the food for fry, and also for trout raised for stocking purposes. But it is now believed that the product can be used for the entire trout output. According to the head of the new Danish trout food firm, that type of fish food produces the healthiest trout specimens. A so-called "wet food" was used by the Danish trout growers before they started importing the dry fish food some 5 years ago. About twice as much dry food will be fed the trout. The dry food is easier to handle, and the trout pond can be operated with less labor. If a trout pond operator shifts over to dry food for his entire production, he can figure that his fish food costs will balance out. (European Regional Fisheries Attaché, United States Embassy, Copenhagen, August 1, 1962.)

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FISHERIES TRENDS, JANUARY-JUNE 1962:

Summary: Denmark's landings and exports of fishery products in the first half of 1962 were at record levels. Industrial fish prices were up slightly, but there had been no agreement on minimum prices for plaice. For the first time countries in the European Economic Community (EEC) are buying more Danish fishery products than countries in the European Free Trade Association (EFTA). Four Danish vessels may go to the Philippines to fish sardines for a United States company. Two of four freezerships for the U. S. S. R. have been launched in Copenhagen. A fish processing plant with a daily capacity of 40,000 pounds of fish fillets and a fish reduction plant are planned for Greenland. Denmark was not invited to the first Common Market fisheries policy meeting of EEC countries. But Denmark's largest fisheries association has asked to have an observer at the next meeting of the European Federation

of Fishing Enterprises (EUROPECHE). Another International Fisheries Fair is planned for Copenhagen in 1964. Increased United States exports to Denmark are not probable. Fishing limits discussions are quiet.



Fig. 1 - Drying plaice. The fishery for plaice is the most valuable in Denmark. Plaice is marketed alive in fish shops throughout Denmark, but sales of plaice fillets are increasing yearly--production in 1960 reached 24,000 metric tons.

Landings: Landings by Danish vessels in the first half of 1962 were 27 percent greater than in the same period of the previous year and 6 percent greater than in the first half of



Fig. 2 - Part of the harbor of Hvide Sande on the west coast of Jutland, Denmark. Landings at this port consist mostly of plaice and herring.

the record year 1959. The increase in 1962 landings would be even more impressive if landings in Denmark by foreign vessels were considered. Heavier landings of industrial fish accounted for most of the increase. A slight increase in industrial fish prices helped attract vessels to the fishery. In June, the arrival of industrial fish at Esbjerg, Denmark's largest port, was so great, 500 tons or more had to be dumped at sea.

Denmark (Contd.):

Table 1 - Danish Fisheries Catch, January-June 1962, 1961, and 1959

Species	January-June		
	1962	1961	1/1959
Landings in Denmark by Danish Vessels:	.....	..... (Metric Tons)	
Salt-Water Fish:			
Plaice	19,883	19,122	12,284
Cod	39,277	40,818	36,665
Herring	85,353	70,144	112,351
Other salt-water fish ²	178,384	123,555	139,752
Total salt-water fish . . .	322,897	253,639	301,052
Fresh-Water Fish:			
Pond trout	3,537	3,679	3,506
Fresh-water fish	1,349	1,251	1,230
Total fresh-water fish . . .	4,886	4,930	4,736
Shellfish:			
Mussels & starfish	8,036	5,885	11,570
Shrimp and other shellfish	2,970	2,462	1,761
Total shellfish	11,006	8,347	13,331
Total fish and shellfish	338,789	266,916	319,119
Landings in Denmark by Foreign Vessels	44,078	25,341	33,164
Danish landings in foreign ports of United Kingdom, Sweden, & Holland	2,355	5,149	2,322

1/Year of record total catch which amounted to 667,800 metric tons valued at 370.2 million kroner (US\$53.6 million).

2/Mostly industrial fish.

Source: Ministry of Fisheries.

Minimum Ex-Vessel Prices: The plan for minimum ex-vessel prices for plaice and other species remains in the talking stage. The minimum ex-vessel price plan calls for prices to be supported by Government and industry through a pool arrangement. The Danish Fisheries Association supports the plan, but the next largest group, the West Jutland Association, is less enthusiastic.

Exports: Total exports of fishery products in the first half of 1962 were greater than in the same period of the record year 1961. The increase was 16 percent in value and 7 percent in quantity. Fishery exports to the United States increased 26 percent in value due mainly to larger shipments of canned herring (up 357 percent in value) and frozen spiny lobsters (up 110 percent in value). But the value of pond trout exports to the United States in 1962 dropped 36 percent, and this means better markets are being found nearer Denmark.

Denmark's exports of fishery products to European Common Market countries in the first 5 months of 1962 were 10 percent above exports to EFTA countries. Denmark is a member of the EFTA. Denmark's exports of fishery products to EEC countries in the first 5 months of 1962 were 50 percent greater than in the same period of 1961, while exports to EFTA countries increased by only about 15 percent.

Table 2 - Danish Fishery Exports, January-June 1961-1962

Products	January-June		1961	
	Metric Tons	Value Kroner	Metric Tons	Value Kroner
All Countries: Fish and fish products	136,350	250,790	36,365	127,704
United States:				
Plaice	347	2,648	543	4,195
Cod fillets, frozen . . .	3,669	11,111	1,611	3,305
Lobster, frozen . . .	96	1,972	286	63
Herring, canned . . .	1,288	4,541	658	161
Other	442	2,654	385	722
Total exports to the United States	5,842	22,926	3,324	4,794
United States	5,842	22,926	3,324	4,794

/Preliminary data.

1/Per Danish krone equals US\$1.145.

Source: Ministry of Fisheries.

Plans For Joint Danish-American Fishing Venture in the Philippines: Several Skagen fishermen are negotiating a contract with a United States company to take four Danish cutters to the Philippines to fish for sardines. The catches would be landed at a Philippine plant for reduction and canning.

Freezer Mothership Vessels Built for U.S.S.R.: Two of four freezer motherships constructed in Copenhagen for the U.S.S.R. were launched in the second quarter of 1962. The 2,600-ton vessels will dress and freeze--but not fillet--the catch of accompanying fishing vessels. Detached cod ends will be hauled aboard over a stern slipway.

Processing and Marketing: A new fisheries enterprise has been planned for Godthaab, Greenland. Financial backing in the amount of 7.5 million kroner (US\$1.1 million) will come from Denmark, the Faroe Islands, and the Royal Greenland Trade Department. Plans called for construction of a fillet plant with a daily capacity of 40,000 pounds in the summer of 1962. Machinery is to be installed during the winter and operations will begin August 1, 1963. A fish reduction plant is also planned for Godthaab.

The last reports concerning the cooperative filleting plant which fishermen are hoping to establish in Esbjerg state that 800,000 kroner (US\$116,000) of the one million kroner (US\$145,000) needed has been pledged.

Tests to determine whether quality is materially affected, if fillets are prepared from frozen fish, have been started at the Technological Research Laboratory of the Ministry of Fisheries in Copenhagen. The tests are expected to be completed late in 1962.

Findus International, Ltd., a new Swiss-Norwegian-Swedish frozen foods company, was established in May 1962. The new Company took over all operations in Scandinavia of the North Norway fish deep-freezing firm

Denmark (Contd.):

A/S Findus including a large modern fish filleting plant at Fredrikshavn, Denmark, which employs 300 people. Findus International, Ltd., plans to expand. In a recently issued booklet, The Findus Saga, the company estimates that more than 200,000 shops in Western Europe now sell about 300,000 metric tons of frozen foods. In 1970, it is expected that 400,000 to 500,000 shops will sell from one million to 1.5 million tons. In Sweden, Findus maintains storage temperatures of at least -4° F. throughout the distribution chain and -22° F. in its main depots. It designed the Polar Reefer, the first ship built exclusively for transporting pallet loads of frozen foods. The Polar Reefer's capacity is 550 tons at -13° F. Current Findus production is reported to be about 40,000 tons annually, consisting of about 100 products.

European Economic Community: The Danish fishing industry is awaiting the development of a European Common Market fisheries policy with considerable interest. Disappointment was expressed at the recent announcement that the Common Market countries will meet this fall before conferring with Denmark, Norway and the United Kingdom in regard to fisheries matters.

The Danish Fisheries Association with a membership of about 11,000 from 175 local groups has applied to EUROPECHE, the federation of national fisheries associations in Common Market countries, for the privilege of sending an observer to the next EUROPECHE meeting.

Fairs and Exhibits: Sponsors of the Fourth International Fisheries Fair which was held in Copenhagen April 1962 have announced that the Fifth International Fisheries Fair will be held September 4-13, 1964.

Imports from United States: There is little opportunity for United States firms to sell more fishery products in Denmark. U. S. distributors visiting Denmark believe frozen scallops might find a larger European market, possibly including Denmark.

Fishing Limits: There have been no further official pronouncements on progress or developments in regard to negotiations over fishing limits around the Faroe Islands since Denmark gave notice to the United Kingdom on April 28, 1962, of termination of the 1959 agreement on fishing limits in the Faroes.

Industry and government views expressed in the press in regard to an extension of Denmark's own fishing limits agree that no change should be sought while the Danish application to join the Common Market is pending. (European Fisheries Attaché, United States Embassy, Copenhagen, August 15, 1962.)

Notes: (1) See Commercial Fisheries Review, Sept. 1962 pp. 69-70, Aug. 1962 p. 59; July 1962 pp. 61 and 88; June 1962 p. 47; March 1962 p. 37; Feb. 1962 p. 64.

(2) Values converted at rate of one Danish krone equals US\$0.145.



Faroe Islands

FISHERIES TRENDS, EARLY SEPTEMBER 1962:

Marketing Frozen Fillets: The fishing industry in the Faroe Islands is concerned over reports of sharply decreased sales of frozen fillets, mainly cod and haddock, in the United Kingdom. About 500 metric tons of fillets have been exported this year at profitable prices through the Faroese sales organization in Thorshavn and a large British importing firm in Grimsby, England, the United States Regional Fisheries Attaché stationed at Copenhagen reports. Faroese newspapers report that the senior officer in the British importing firm has stated that his company's refrigerated warehouses are filled with quick-frozen fillets which they have been unable to move at prices competitive with the iced fish still favored by many British housewives. British imports of Faroese frozen fillets are not expected to stop completely but they may be curtailed.

An especially large number of vessels had been expected to participate this fall and winter in the Faroese local long-line fishery for cod and haddock for delivery to the British market. The United States has imported Faroese fishery products in the past and is now being mentioned as a market for this year's production of frozen fillets.

The total production of fillets in the Faroe Islands was 1,585 tons in 1961, 1,223 tons in 1960, and 571 tons in 1959, according to the Faroese release, "Faroese in Figures," No. 18, June 1962.

Salted Herring: Despite favorable weather, only 43,700 barrels of salted herring had been landed in Faroese ports by September 1, 1962, as compared with 79,300 barrels by the same date last year. The Faroese herring

Faroe Islands (Contd.):

sales organization has arranged salted herring sales contracts calling for the delivery of 70,000 barrels to Sweden, 20,000 barrels to Denmark, and 3,000 barrels to East Germany. In order to meet the contracts, an extra effort was going to be made to increase the herring catch between mid-September and the beginning of October. That period is the last, but usually the best, part of the herring season. (September 19, 1962, report from the Fisheries Attache, United States Embassy, Copenhagen.)



German Federal Republic

JAPANESE CANNED TUNA PRICES:

In mid-September 1962, Japanese canned tuna price quotations to West German importers for light meat solid pack tuna in cotton-seed oil, c.i.f. West German ports, were:

Bluefin: (48 3½-oz. cans) . .	\$4.17 a case
(48 7-oz. cans) . .	\$7.10 a case
Skipjack or yellowfin:	
(48 7-oz. cans) . .	\$7.30 a case

German importers expect little change from the above prices in the near future. The canned tuna products described above make up the bulk of West German imports of canned tuna from Japan. Chunk style tuna and tuna packed in brine are imported only occasionally. (United States Embassy, Bremen, September 14, 1962.)



Greece

NEW MECHANICAL DEVICE FOR HAULING IN PURSE-SEINE NETS INVENTED BY SHIOPOWNER:

A new mechanical device for hauling in purse-seine nets was recently installed in a Greek purse-seiner. It was reported as giving satisfactory results. The device, which was invented by a Greek shipowner, consists of one pulley which is hung from a mast at the vessel's center towards the stern. A screw inside the mast starts the pulley operating. The pulley, together with a clutch located inside the vessel, is powered by the main engine.

The pulley is made of hard aluminum and has an open space of 45 centimeters (17.7 inches). The inside of the pulley is rubber-coated. As it turns, the net is hauled in without causing the slightest damage to the mesh.

By using this device, a purse seine 1,800 feet long and about 400 feet deep has been hauled in full of fish in 18 to 22 minutes with the aid of only 3 men.

The Greek purse-seiner using the new invention is owned and operated by the inventor. In 20 days of fishing, the vessel caught 88,000 pounds of fish which was considered an achievement in the Greek commercial fishery.

The operation of the new mechanical device was hailed as significant in Greece's fishing industry. It was pointed out that it was inspired by an entirely different concept from that of the "power block" used in the United States tuna fishery. (*Alieia*, Athens, Greece, August 1962.)

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FREEZER-TRAWLER FLEET EXPANDED:

Another freezer-trawler, the *Zephyros IV*, was added to Greece's Atlantic fleet of freezer-trawlers in August 1962. This brings the Greek freezer-trawler fleet engaged in the Atlantic fishery to 17 vessels of that type. The vessel was bought in Germany, and underwent extensive modifications at Piraeus under the technical supervision of one of Greece's foremost fishing firms. The new vessel is the fourth of that type owned by the firm.

The *Zephyros* is 144 feet long by 26 feet broad, has a depth of 14 feet, and is 399 gross tons. Its main engine is 820 horsepower, and during her trials, the vessel developed a speed of $12\frac{1}{4}$ knots.

The new vessel is capable of freezing 12 metric tons of fish every 24 hours at -45°C . (-49°F .), and its holding capacity of frozen fish is 170 tons at -25°C . (-13°F .).

The day following her dedication, the vessel left for the Mauretania fishing grounds with a crew of 26.

In July 1962, 4 Greek freezer-trawlers landed 1,191 metric tons of frozen fish, as against 6 vessels with 1,850 tons the previous month. In July 1961, 4 vessels of this type brought in 1,055 tons of frozen fish. In the period January through July 1962,

Greece (Contd.):

Greek freezer-trawlers landed 8,672 tons of frozen fish as compared with 7,543 tons in the same period of 1961. (Alieia, Athens, Greece, August 1962.)

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NEW FISH CANNERY TO BE BUILT:

The construction of a large fish cannery is planned for Cavalla in eastern Macedonia, an important fishing center in Greece. The plant is expected to be able to process from 800 to 1,000 metric tons of fish annually, mainly sardines and anchovies.

The proposed cannery will be an enterprise operated mainly by owners of local salt-fish plants and Cavalla fishing boat owners, who will be sold proportional shares of stock. (Alieia, Athens, Greece, August 1962.)

**Guatemala****JOINT JAPANESE-GUATEMALA FIRM
FISHING SHRIMP OFF CENTRAL AMERICA:**

The shrimp fishing operation along the coast of Guatemala, Central America, jointly carried out by a Japanese firm and local Guatemala interests, has been using 14 vessels and some chartered vessels. Fishing conditions were reported favorable in August 1962.

The joint company has decided to add six more vessels, thus expanding its fleet to 20 vessels by November in an effort to increase catches. The six vessels are now under construction at a shipyard in Jacksonville, Fla., and they are of the 50-ton class. (Suisan Tsushin, August 30, 1962.)

**Iceland****FISHERIES TRENDS,
EARLY SEPTEMBER 1962:**

Summer Herring Fishery: A record catch of 311,838 metric tons of herring valued at 392.9 million kronur (US\$9.1 million) had been landed off the north and east coasts by September 9, 1962, as compared with 211,136 tons caught by the same date during last

year's good season. The 1962 summer herring fishery is about over, but south coast herring operations could not begin because no price had been set for landings there. As many as 235 vessels took part in the summer herring fishery this year. The average share of the catch for deckhands amounted to 58,892 kronur (US\$1,368) and, for skippers, 148,073 kronur (US\$3,439).

Herring Salting: Summer herring salting was resumed August 25, because of the possibility of a new contract for 20,000 barrels with the U. S. S. R. Salting had been shut down temporarily since August 19, because all existing contracts for summer herring were filled.

The first contract for salted herring from the anticipated south coast winter catch was signed and it provided for delivery of 25,000 barrels of specially-cured split herring to West Germany.

Other Fisheries: The off-shore trawlers continued bringing in good catches (principally of ocean perch). They were fishing off western Greenland and, to a limited extent, off Newfoundland. The 15 trawlers operating off Iceland reported rather poor catches of cod and haddock. An Icelandic fisheries scientist was quoted in the British Fishing News as saying that Iceland's extension of its fishing limits has had an extremely beneficial effect upon fish stocks off the Icelandic coast where the small fishing vessels have done well. He predicted that before long the increased fish stocks would move outward where the trawlers would benefit.

The lobster catch was very good and was expected to exceed considerably last year's catch of 2,000 tons. (United States Embassy, Reykjavik, August 31, and September 14, 1962.)

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**SEEKS U. S. LOAN TO AID
FISH-PROCESSING PLANTS:**

The Icelandic Government has requested a loan of 29 million kronur (US\$673,478) from the United States from the 1961 and/or 1962 U. S. Public Law 480 (Agricultural Trade Development and Assistance Act of 1954) agreements. Iceland asked that the loan be made to the Icelandic Development Bank for the Fisheries Loan Fund. Iceland's Fisheries Loan Fund would use the money mainly to increase loans to fish processing plants. U. S. loan under Public Law 480 would be made in Icelandic kronur rather than in U. S. dollars.

Iceland's Fisheries Loan Fund has been used mainly to improve the fishing fleet. By now increasing fish processing facilities through loans, Iceland hopes to add value to fish exports, which make up 93 to 96 percent of its tangible exports. It is estimated that a large part of loans to fish processing plants (freezing plants, oil and meal plants, salt fish plants)

Iceland (Contd.):

would be absorbed by local costs, such as labor, supplies, and construction material. Less than a third would go for machinery such as boilers, motors, filleting machines, conveyor belts, and refrigeration units.

The United States has already used the authority of Public Law 480 to aid Iceland's Industry Loan Fund. This fund makes modest loans to individual manufacturers to purchase machinery. The Industry Loan Fund loaned 4.4 million kronur (US\$102,183) in 1960. The Fisheries Loan Fund has a far greater scope and loaned 182.9 million kronur (US\$4.2 million) in 1960.

Part of a statement by the Government of Iceland describing the Fisheries Loan Fund follows:

History and Operations of the Fund: The Fisheries Loan Fund was established by law in 1905 for the purpose of promoting the development of fisheries in Iceland with loans for purchase of new fishing vessels. At that time a breakthrough was taking place in Icelandic fisheries as the first motor boats were introduced. The Fund was later authorized to grant loans for construction of fish-processing plants as processing of fish became more important.

The Fund grants loans to a maximum of 75 percent of the purchase price of new fishing vessels. The loans are repaid in 15 years with 6-1/2 percent interest. Equipment loans are of shorter duration. The maximum amount loaned for processing plants is 60 percent of construction costs, which must be repaid within 12-15 years.

Sources of Income: The main source of income to the Fund is a 1.8-percent levy on exports of fish and fish products, which yielded 35.3 million kronur (US\$819,786) in 1961. Interest on loans (gross) amounted to 15.4 million kronur (US\$357,640). The Fund receives besides this an annual Government grant of 2.0 million kronur (US\$46,447). The debts of the Fund consist almost entirely of long-term foreign credits.

Loan Operations in Recent Years: Loan operations increased sharply in 1960 and continued at the higher level in 1961 and 1962. New and larger steel vessels were bought to replace smaller wooden ones. Operators started to equip their boats with a new and more efficient technique for catching herring. The Fund's current resources were not sufficient to meet the heavy demand for loans so in 1961 long-term loans were taken by the Fund.

Operations in Period Ahead for which Additional Financing is Sought: Great technical changes have been taking place in fishing in recent years requiring large investments in new equipment. It is therefore of great importance to finance such equipment on a fairly large scale. At the same time it is becoming important to invest more in fish-processing plants both to improve efficiency and make it possible to receive the larger catches now being landed. Here the main emphasis will be on freezing plants and herring processing plants.

The larger part of the resources of the Fund will continue to be used for financing new boats built abroad. Additional financing to the amount of 29 million kronur (US\$673,478) is sought in order to make it possible for the Fund to meet other urgent needs of the fishing industry. It is planned to use the requested funds for the following categories of loans:

1. Loans to fish-processing plants to enlarge capacity and install more modern machinery.
2. Loans for new equipment and modernization of fishing boats in order to reap the benefit of new fishing techniques.
3. Loans to finance the building of fishing boats in Icelandic yards. These are mostly the smaller type wooden boats used for inshore fishing. (United States Embassy, Reykjavik, September 19, 1962.)

EXPORTS OF FISHERY PRODUCTS, JANUARY-JULY 1962:

During January-July 1962, there was a considerable increase in exports of frozen herring, frozen fish fillets, salted herring, herring oil, and herring meal as compared with

Product	Icelandic Fishery Exports, January-July 1962 with Comparisons					
			Jan.-July 1962		Jan.-July 1961	
	Qty.	Value f.o.b.	Metric Tons	US\$ K.R.	Metric Tons	US\$ K.R.
Salted fish, dried	1,370	26,402	613	2,807	52,481	1,375
Salted fish, uncured	22,719	271,931	6,355	22,719	222,900	5,625
Wings, salted	383	1,000	1,000	1,000	250	517
Stockfish	5,691	145,877	3,384	6,062	139,640	3,659
Herring on ice	4,899	17,144	398	3,754	9,630	252
Other fish on ice	13,932	63,839	1,481	16,660	70,524	1,848
Herring, frozen	16,047	87,423	2,028	10,068	48,151	1,262
Other frozen fish, whole	973	12,815	300	7,729	202	—
Fish fillets	32,498	10,900	1,090	22,590	30,000	9,000
Shrimp and lobster, frozen	195	16,758	389	253	18,477	484
Roses, frozen	617	11,770	273	504	6,547	172
Canned fish	155	7,874	183	7,640	200	—
Cod-liver oil	2,767	22,097	513	2,447	19,806	519
Lumpfish roes, salted	362	5,625	131	394	6,560	172
Other fish for food, salted	2,742	37,889	899	2,949	24,837	657
Roach for bait, salted	575	1,142	142	1,111	1,111	144
Herring, salted	17,670	161,937	3,757	11,561	95,084	2,491
Herring oil	19,917	80,740	1,989	26,883	704	—
Ocean perch oil	15	59	1	196	1,109	29
Whale oil	388	2,558	59	917	6,452	169
Fish meal	17,879	112,062	2,600	24,401	93,886	2,467
Herring meal	23,539	150,000	3,494	12,700	97,100	1,512
Ocean perch meal	34	204	—	1,989	6,094	82
Wastes of fish, frozen	2,639	6,487	150	5,247	9,924	260
Liver meal	195	1,285	30	235	1,287	34
Lobster and shrimp meal	—	—	—	249	540	14
Whale meal	402	2,151	50	1,192	4,168	109
Whale meat, frozen	1,162	9,046	210	315	2,080	55

Note: Values converted at rate of 1 kronur equals 2.32 U.S. cents in 1962 and 2.62 U.S. cents in 1961.

the same period in 1961, according to the Statistical Bureau of Iceland's Statistical Bulletin, August 1962. Exports of fish meal and ocean perch meal showed a considerable decrease in the first seven months of 1962.

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UTILIZATION OF FISHERY LANDINGS, JANUARY-MAY 1962:

How Utilized	January-May	
	1962	1961
Herring ^{1/} for:	(Metric Tons) . . .	
Oil and meal	57,924	19,275
Freezing	13,585	7,416
Salting	—	6,037
Fresh on ice	7,718	4,119
Canning	69	—
Groundfish ^{2/} for:		
Fresh on ice landed abroad	12,522	13,523
Freezing and filleting	74,853	80,462
Salting	59,625	51,408
Stockfish (dried unsalted)	29,918	40,384
Home consumption	4,361	3,395
Oil and meal	974	1,449
Shellfish for:		
Freezing: Lobster	122	252
Shrimp	263	304
Canning (shrimp)	86	126
Total production	266,852	228,150
1/Whole fish.		
2/Drawn fish.		

* * * * *

Iceland (Contd.):

FISHERY LANDINGS BY PRINCIPAL SPECIES, JANUARY-MAY 1962:

Species	January-May	
	1962	1961
Cod	141,258	143,420
Haddock	14,447	15,836
Saithe	5,561	4,238
Ling	4,065	3,321
Wolffish (catfish)	8,659	8,091
Cusk	3,517	3,438
Ocean perch	2,656	9,976
Halibut	523	595
Herring	84,129	36,847
Shrimp	349	430
Other	1,688	1,958
Total	266,852	228,150

¹Except for herring which are landed round, all fish are drawn weight.



Japan

TENTH SALE OF CANNED TUNA IN BRINE FOR EXPORT TO THE U.S.:

The Japan Canned Foods Exporters Association convened a meeting of its Canned Tuna Sales Standing Committee on September 18, 1962, and approved the tenth sale of canned tuna in brine for export to the United States. A total of 130,000 cases (48 7-oz. or No. $\frac{1}{2}$ cans per case) of tuna packed in brine (consisting of 75,000 cases of white meat and 55,000 cases of light meat tuna) were approved for this sale, with deliveries to be completed by November 24. Export prices per case remain unchanged: white meat US\$10.40; light meat \$7.80 a case, f.o.b. Japan.

Japanese export of canned tuna in brine to the United States up to and including the tenth sale will total 2,073,000 cases, consisting of 1,178,000 cases of white meat and 895,000 cases of light meat tuna. (Suisan Tsushin, September 20, 1962.)

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PACKERS SEEK REMOVAL OF RESTRICTIONS ON U. S. IMPORTS OF CANNED TUNA:

The Japanese periodical Nihon Suisan Shimbun of October 8 reports that the Japan Canned Tuna Packers Association petitioned the Fisheries Agency to negotiate, during the meeting of the Japan-United States Joint Committee on Trade and Economic Affairs

slated to be convened in Washington, D. C., in November 1962, for removal of restrictions placed by the United States on imports of Japanese canned tuna. The Canned Tuna Packers Association is reportedly seeking removal of the 12.5-percent tariff imposed by the United States on imports of tuna packed in brine and the reduction of the United States tariff on imports of tuna packed in oil from the present 35 percent to 12.5 percent.

According to the Japanese periodical, the existing United States tariff quota exerts a tremendous effect on Japan's canned tuna exports. Originally, the United States tariff quota on imports of canned tuna in brine was established in 1955 only to regulate imports from Japan, but, subsequently, European countries also began to export canned tuna in brine to the United States at lower prices than Japan, thus needlessly increasing price competition in marketing that product.

The percentage of United States imports of Japanese tuna packed in brine has declined yearly during the past five-year period, from 94.24 percent in 1957 to 79.94 percent in 1961, as shown in table.

Percentage of United States Imports of Japanese Tuna Packed in Brine	
Year	Percentage of Imports from Japan
1961	79.94
1960	83.35
1959	80.58
1958	89.01
1957	94.24

The United States does not apply quota restrictions on imports of tuna packed in oil but assessment of an import duty of 35 percent ad valorem virtually precludes the possibility of foreign countries exporting canned tuna in oil to the United States, reports the Japanese periodical. (Nihon Suisan Shimbun, October 8, 1962.)

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CANNED TUNA INDUSTRY TRENDS, AUGUST 1962:

Although poor summer albacore tuna fishing has resulted in a light pack of white meat for export to the United States, good skipjack fishing has increased the ratio of the pack of light meat.

As of early August, a fairly large quantity of albacore tuna was expected to be canned since good albacore fishing was reported in

Japan (Contd.):

the Indian Ocean. At least 200,000 to 300,000 cases of white meat are expected to be packed from Indian Ocean albacore.

Assuming that about the same quantity will be packed from winter albacore, it may be possible that half of this year's production quota of 2.4 million cases will be white meat, including some 650,000 cases already sold. But the pack of light meat from now on depends largely on landings and ex-vessel prices of skipjack. Also, this year's skipjack are small, requiring more processing time. If Indian Ocean albacore can be bought for \$352 per metric ton, some packers may prefer to use albacore instead of restricting their pack to skipjack.

Some 330,000 cases (excluding the 8th sale) of white meat tuna were in stock at the sales company as of early August. It is expected that the 9th through the 11th sales can be adequately taken care of with the present white meat stocks. (Suisan Tsushin, August 6, 1962.)

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CLAIMS MOUNT AGAINST JAPANESE FROZEN YELLOWFIN TUNA EXPORTS TO THE UNITED STATES:

A JETRO (Japan Export Trade Promotion Association) report reveals that claim problems against Japanese frozen yellowfin tuna exported to the United States are common occurrences now. A United States cannery which recently imported 70 tons of frozen yellowfin tuna from Japan reportedly claimed a price adjustment for approximately 20 percent of the shipment because of the dark color of the tuna meat, because the packer had to pack them as grated tuna.

A similar claim was made by another United States packer against Japanese frozen yellowfin tuna loins delivered in August 1962. The loins were generally inferior in color quality, except for a small percentage which retained the normal color of tuna loins. The packer reportedly demanded a \$40 per ton discount for the shipment, claiming that the dark meat tuna loins delivered would have to be packed as second grade tuna, and warned that all further contracts would be cancelled unless this condition was met.

In view of the problems that have arisen out of exports of inferior quality loins, Japan

must enforce a more rigid quality control and establish a quality grading system, reports the Japanese periodical Nippon Suisan Shim bun, October 1, 1962.

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SLUGGISH FROZEN TUNA MARKET CAUSES CONCERN:

The Japan Frozen Foods Exporters Association held a meeting of its Atlantic committee in mid-September 1962 to discuss the sluggishness of frozen tuna exports to the United States. No conclusion was reached at the meeting. Most of those present seemed to agree that the situation could be eased a little by concentrating their efforts on exporting to the European market. Market conditions in Europe for frozen tuna are considered more favorable than in the United States. Some expected a plan for each exporter to independently regulate exports to the United States, but it was unanimously agreed not to suggest a temporary withdrawal of offers.

The United States is the largest market for Japanese frozen tuna. Between April and July of 1962, more than 20,000 short tons were licensed for export to the United States. The price during that period reached \$375 per short ton f.o.b. Japan for yellowfin tuna weighing 20-80 pounds. By the end of July, however, the market became weak and as of mid-September no sales were reported completed. In many cases, offers were made at prices less than \$300 per ton f.o.b. Japan for yellowfin tuna.

Under the circumstances, the Export Frozen Tuna Fisheries Association and the Japan Frozen Foods Exporter Association were trying to find some means to cope with the sluggish tuna market.

Contracts were being concluded around future delivery orders, some of which were as late as for January 1963. The industry was trying to find some way of alleviating the situation. Some of the suggestions were: (a) land more of the catch in Japan by chartering carriers, (b) store catch in local cold-storage plants and wait for improvement of market conditions, and (c) concentrate on exports to Europe. Demand in Japan was still strong and the ex-vessel price was high compared with the sluggishness of the export market. Exports to Europe were still reported at \$400 c.i.f. a long ton on yellowfin tuna. The industry was of the opinion that exports to Europe may be continued at a high level even

Japan (Contd.):

though exports to the United States have dropped off because at the time there was still a shortage of raw tuna in Europe. (Suisan Keizai Shim bun, September 18, 1962.)

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SECOND JAPAN-UNITED STATES TUNA MEETING AS REPORTED BY JAPANESE:

The second Japan-United States tuna conference convened on October 9, 1962, in the conference room of the Japanese Foreign Ministry. The meeting opened with a speech of welcome by the Japanese Ambassador Yagi to Iraq, representing Japan, followed by addresses delivered by the United States Delegate, Assistant Secretary of the Interior for Fish and Wildlife Briggs, and Japanese Minister of Agriculture and Forestry Shigemasa. Delegates of the United States and Japan were then introduced, and the Japanese senior delegate, Yagi, was elected chairman of the meeting. Gist of the speeches delivered by the three delegates is as follows:

Yagi: "The tuna fishery occupies a particularly important place in the fishing industry. Japan presently exports much of her frozen tuna and canned tuna to the United States. It is my sincere desire that this second tuna meeting between the two closely interrelated countries of the United States and Japan will, through frank discussions of tuna problems and exchange of information and data on tuna, contribute to the enhancement of friendly, cooperative relationships that were established at the first tuna meeting held between the two countries."

Briggs: "This meeting is the outcome of the talk held in May this year between Secretary of the Interior Udall and former Agriculture and Forestry Minister Kono, during which an agreement was reached that, 'Friends should have a heart-to-heart talk on problems of common interest.' To the extent permitted, we would like to discuss marketing, processing, and resources, through which we hope to develop more effectively the friendly relations now existing between our two countries. At the same time, we wish to exchange views on the size of tuna resources and on the tuna industry problems confronting our two countries. Viewed from the present state of marketing and of sharing the market, this tuna meeting has an important significance for two reasons: (1) both Japan and the United States have a high tuna production capacity, (2) both nations must develop effective means by which to maintain quality, expand market, and conserve resources. Our two countries together produce approximately 80 percent of the total world tuna production. Exchange of views would be a most effective way to develop the tuna industry of our two countries. We expect this second tuna meeting to result in a free and timely exchange of tuna information and we hope for continued frank exchange of information."

Shigemasa: "In the first tuna meeting, information on tuna resources, tuna fishery, utilization, and processing was exchanged, and a deeper understanding was also gained on marketing problems. We hope that this second meeting will be a similar gathering for exchange of research data and discussions of trends and problems of fishery, marketing, and trade. In view of the high production of the tuna fishery, the Japanese Government will take measures to ensure effective and continued utilization of the tuna resources. It is particularly desirable that both Japan and the United States continue to cooperate closely hereafter in order to acquire a more accurate knowledge of tuna resources of the Pacific Ocean, which is a matter of common concern of both of our countries. We hope that, through frank exchange of views on market and on measures to be adopted for the promotion of tuna demand, the tuna trade between Japan and the United States will develop into a healthy, fair, and smooth commerce between our two countries." (Shin Suisan Shim bun Sokuho and Suisan Tsushin, October 10, 1962.)

* * * * *

REGULATIONS ON LANDING AND TRANSFER OF TUNA CATCHES

RELAXED BY JAPANESE GOVERNMENT:

The Japanese Fisheries Agency announced on September 6, 1962, the revision of the regulations governing the operation of medium and distant-water tuna vessels and portable-vessel-carrying tuna motherships, as follows:

A. Permit to Operate in Atlantic Ocean:

Medium tuna vessels (40-100 tons gross) shall henceforth not be required to submit notification of intent to operate in the Atlantic Ocean. Portable-vessel-carrying tuna motherships will be permitted to operate in the Atlantic Ocean even if they do not intend to export their catches or their processed products.

B. Permit to Transfer Catches at Sea in Atlantic Ocean:

Licensed medium-tuna vessels and distant-water tuna vessels (over 100 tons gross) shall be permitted to transfer mutually between them their catches at sea, provided that on each occasion they obtain prior approval to do so.

C. Permit to Ship Catches to Japan Proper:

Medium and distant-water tuna vessels, as well as portable-vessel-carrying motherships, are authorized to land or transfer their catches at foreign ports for shipment back to Japan in the following cases, provided that, in each of the cases they obtain prior approval for each landing or transfer.

1. When the landing or transfer of Atlantic Ocean-caught fish is made at ports bordering the Atlantic Ocean.

2. When the transfer of Indian Ocean-caught fish is made at Singapore or when the landing or transfer of Indian Ocean-caught fish is made at Penang.

3. When the landing or transfer of Pacific Ocean-caught fish is made at bases in the Pacific Ocean, where vessels operate under long-term contract.

4. When the landing or transfer of Pacific Ocean-caught fish is made at ports bordering the Pacific Ocean. However, in that case, those ports may be designated in advance.

D. Landing or Transfer of Catches for Export Purposes:

Medium and distant-water tuna vessels, as well as portable-vessel-carrying motherships, are authorized to land or transfer their catches at foreign ports for export purposes in the following cases, provided that, in each case, they obtain prior approval for each landing or transfer.

1. When the landing or transfer of Atlantic Ocean-caught fish is made at ports bordering the Atlantic Ocean. However, the quantity may be stipulated.

2. When the landing or transfer of Indian Ocean-caught fish is made at Penang, or when the transfer of Indian Ocean-caught fish (frozen) is made at Singapore. However, the quantity may be stipulated.

E. Landing and Transfer of Catches Under Long-Term Contract:

Tuna vessels under long-term (overseas) contracts may land their catches at foreign ports as follows:

1. Medium and distant-water tuna vessels, as well as portable-vessel-carrying motherships, which operate in the Atlantic Ocean, may land their catches at ports bordering the Atlantic Ocean for export to countries where tuna exports to those countries are not regulated by the Japan Export Frozen Tuna Producers Association.

2. Medium and distant-water tuna vessels may land catches taken from the Pacific and Indian Oceans in

Japan (Contd.):

countries bordering those oceans if the catches are to be consumed within those countries.

3. Fishing vessels operating under long-term contracts may land their catches at foreign ports, provided their plans for landing, selling (including exporting), and shipping the catch back to Japan have been originally approved by the Minister of Agriculture and Forestry. (Suisan Keizai Shimbun, Suisan Tsushin, Japanese Periodicals, September 6, 1962.)

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FROZEN TUNA EXPORTS TO EUROPE AND AFRICA, APRIL-JULY 1962:

The licensed quantity of Japanese frozen tuna exports to Europe and Africa, April through July 1962, amounted to 13,384 long tons, according to Japan Frozen Foods Exporters Association. Half of the quantity (somewhat more than 9,000 tons) was for Italy. Future expansion of exports is anticipated.

Licensed quantities of Japanese frozen tuna exports to Europe and Africa by country April-July 1962 were (in long tons): Italy 9,344, Yugoslavia 3,033, France 418, Ghana 392, Czechoslovakia 192, Australia 5; a grand total of 13,384. (Suisan Keizai Shimbun, August 25, 1962.)

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DIRECT FROZEN TUNA EXPORTS FROM ATLANTIC TUNA VESSELS TO EUROPEAN AND AFRICAN COUNTRIES, 1961:

Japan's Atlantic tuna fleet directly exported more tuna to European and African countries in 1961 than in 1960. The increase amounted to 6.8 percent in quantity and 15.7

Direct Japanese Frozen Tuna Exports from Atlantic Tuna Vessels to European and African Countries, January-December 1961

Destination	Quantity	Value	Metric Tons	US\$1,000
Italy	28,956	7,308		
Yugoslavia	10,503	2,901		
Tunisia	668	180		
Libya	435	110		
Spain	770	158		
Czechoslovakia	1,957	462		
Guinea and Ghana	212	30		
Total, Jan.-Dec. 1961 . . .	43,501	11,149		
Total, Jan.-Dec. 1960 . . .	40,746	9,640		

percent in value. Italy was the leading buyer of direct Japanese tuna exports from the Atlantic in 1961 with 66.6 percent of the total quantity.

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ONE DISTRICT TO EXPAND SKIPJACK TUNA FISHERY:

The Hokkaido Fisheries Society directors met early in August and decided to establish the Hokkaido Public Corporation to expand the skipjack tuna fishery. A total of US\$166,667 (\$83,333 from the Hokkaido Government and the same amount from the fisheries cooperatives) will be invested for the purpose of converting trout, herring, sardine, and other sluggish coastal fisheries, principally in the Japan Sea, to skipjack tuna fishing in order to stabilize their fishing operations. (Japanese periodical, August 7, 1962.)

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TUNA LANDINGS BY SPECIES, 1955-61:

Direct landings of skipjack, bluefin, albacore, big-eyed and yellowfin tuna in Japan in 1961 amounted to 438,889 metric tons, up 23.3 percent from the 355,925 tons in 1960, and up 7.8 percent from the 407,271 tons in 1959. The total landings of those tuna species in 1961 were larger than in 1960 because of heavier landings of big-eyed tuna (up 47.7 percent),

Landings in Japan of Certain Tuna Species, 1955-61					
Year	Skipjack	Bluefin	Albacore	Big-eyed	Yellowfin
1961	144,192	68,282	44,151	99,166	83,098
1960	78,546	64,449	60,721	67,124	85,085
1959	166,628	44,202	46,971	70,604	78,866
1958	147,388	21,092	46,327	70,046	76,735
1957	97,418	34,166	68,111	57,495	75,613
1956	97,976	36,919	58,654	47,074	76,875
1955	99,626	23,081	40,560	40,759	62,280

Note: Does not include direct Japanese tuna landings in foreign countries.

skipjack (up 83.6 percent), and bluefin (up 5.9 percent). The increases were partly offset by declines in the catch of albacore (down 37.5 percent) and yellowfin (down 2.3 percent).

These statistics were compiled by the Japanese Government, according to the Japanese periodical Suisan Tsushin, August 7, 1962.)

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TUNA FISHING FORECAST FOR PACIFIC OCEAN, SEPTEMBER 1962:

The Kanagawa Prefecture Fisheries Experimental Station late in August 1962 released its forecast of Pacific Ocean tuna fishing in September 1962.

Central Pacific (20° N. latitude-10° S. latitude, east of 150° W. longitude): In the sea area from the Equator to 10° N. latitude, big-eyed catch was expected to be high all over the area with the exception of waters around the equator and 120° W. longitude. Because the catch in the area has been decreasing yearly since 1960, there was a probability that it would be less than last year. In the sea area between 5°-10° N. latitude, a comparatively large catch of black marlin was expected.

Japan (Contd.):

South of the Equator, roughly 4° - 10° S. latitude, good catches of big-eyed tuna were expected, but the catches would be less in the area around and west of the Marquesas Islands.

East of 130° W. longitude, considerable yellowfin catches were anticipated mixed with other species.

The expected catch rate per 1,800 hooks was: 2.9 metric tons (0.8 ton of yellowfin, 1.6 tons of big-eyed, and 0.5 ton of black marlin) in the northeast sea area of the Fanning Islands; east of Christmas Island, a total of 3.1 tons (2.2 tons of big-eyed and 0.9 ton of black marlin); a total of 4.3 tons (1.6 tons of yellowfin, 2.2 tons of big-eyed, and 0.5 ton of black marlin) around 7° N. latitude, 125° W. longitude; a total of 5.7 tons (1.1 tons of yellowfin and 4.6 tons of big-eyed) around 5° N. latitude, 105° W. longitude; south of the Equator, a total of 2.9 tons (1.5 tons of yellowfin, 1.4 tons of big-eyed); in the north-eastern area of the Marquesas Islands, a total of 3.7 tons (1.4 tons of yellowfin, 2.3 tons of big-eyed); in the sea area 4°-10° S. latitude, 120°-130° W. longitude, a total of 4.3 tons (2.0 tons of yellowfin, 2.3 tons of big-eyed).

Southeastern Pacific (south of 10° S. latitude, east of 150° W. longitude): Some albacore were expected to be caught east and southeast of the Pomotu Islands. The catch in the northern area of 20° S. latitude and south was expected to be somewhat different—a catch rate of 3.2 tons (1.2 tons of yellowfin, 0.6 ton of big-eyed, 0.8 ton of albacore, and 0.6 ton of striped marlin) was expected in the northern portion of the area while in the southern portion the catch rate was expected to be 3.5 tons (1.2 tons of yellowfin, 0.6 ton of big-eyed, 1.1 tons of albacore, and 0.6 ton of striped marlin).

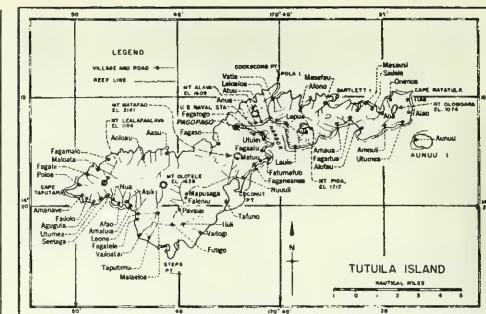
Northern central and Northeastern Pacific (north of 20° N. latitude, east of 170° E. longitude): Big-eyed fishing was expected to continue poor around 30° N. latitude, but catches were expected to increase in the entire area and schools were expected to appear early in September. Catch was expected to be all big-eyed with a rate of 3.0 tons around Midway and 0.5 ton north of the Hawaiian Islands, 1.5 tons east of 150° W. longitude. Also, in the northern sea area of Ocean Island, albacore was expected to be caught with big-eyed when they began to appear in September with a catch rate of 0.76 ton (0.25 ton big-eyed and 0.51 ton albacore).

Central Pacific (20° N. latitude-10° S. latitude, 150° W. longitude-170° E. longitude); A poor fishing period was expected to prevail for big-eyed in the area 5°-13° N. latitude and also 5° N. latitude-5° S. latitude. In the sea area, from Jalini Island and the Gilbert Islands to the north of the Fanning Islands, black marlin was expected to be caught mixed with other species and some albacore was expected in the area from the Ellice Islands to the Tokelau Islands. (Japanese periodical, August 29, 1962.)

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**ANOTHER FIRM TO START
AMERICAN SAMOAN FISHING
OPERATIONS IN JANUARY 1963:**

Another Japanese fishing company, which earlier in 1962 received a tuna catch quota of 6,000 metric tons for its American Samoan base, plans to commence fishing operations out of Samoa in January 1963 with 22-23 fishing vessels. Of that fleet, one 85-ton vessel (Heian Maru No. 2) had already departed Japan for Samoa, ten 99-ton vessels are under construction for delivery in 1962, and the remaining 12 will be contracted with vessel owners in Japan.



Tutuila, main island of the Territory of American Samoa

Reportedly, all catches landed by the Japanese firm's fishing vessels will be sold to the United States cannery in Samoa through two Japanese export firms: one will handle 2,000 metric tons of the catch and the second will handle 4,000 metric tons. (*Shin Suisan Shimbu* Sokocho, October 3, 1962.)

Note: See Commercial Fisheries Review, July 1962 p. 77.

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TUNA VESSEL DEMONSTRATES EFFICIENCY OF POWER BLOCK:

A large Japanese company's surrounding-net (purse-seine) vessel Kenyo Maru (240 gross tons), which tested a United States power block, completed its second trip and returned in September 1962 to the fishing port of Shiogama in northeastern Japan with close to 25,3 short tons of skipjack tuna. The skipper commented as follows concerning the efficiency of the power block.

"The power block is a simple device and yet produces no slippage. It easily lifts the net from the water and can be adequately handled by the 18 persons we employed in the recent trial operations. Perhaps it can even be handled by 14 persons, with two men handling the float line, two on the lead line, and the remainder working the body of the net. Without the power block, a vessel of this size would have required 27 men, including the skiff men.

"The net-lift ability of the power block is indeed amazing. We pursed the surrounding net by hand, but this should be done by hydraulic winch and the net should also be made of heavier twine.

"The power block weighs 616 pounds, so it would be difficult to mount this unit on top-

Japan (Contd.,):

heavy vessels, such as the 85-ton two-boat surrounding net vessels. There is need to devise ways of using the power block even at lower positions. We tried this, but on the Kenyo Maru it would cause the power block to protrude beyond the stern.

"At full speed, the power block can lift the entire net in 20 minutes, and at slow speed in 100-110 minutes.

"After gaining more experience, we should be able to operate this unit more efficiently in offshore waters, as well as in coastal waters. In the southwest Pacific Ocean, however, the operating method would have to be improved due to different oceanic conditions." (Suisan Keizai Shimbun, Japanese periodical Sept. 12, 1962.)

Note: See Commercial Fisheries Review, September 1962 p. 89.

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TUNA INDUSTRY TRENDS:

The Japanese report that demand for tuna is expanding yearly; and the Japanese export of tuna products is going on smoothly. But the continued shortage of raw tuna is threatening to curtail Japanese production of tuna products. The Japanese tuna packers association has formed a committee to study the problem of the raw material shortage in Japan.

According to Japanese Government catch statistics for 1961, the total Japanese tuna catch amounted to some 650,000 metric tons. Complete data on how the catch was used is not available, but 150,000 tons were exported as frozen tuna. Also, some 20,000 tons of fresh tuna were exported from overseas bases. The remaining 480,000 tons were used or processed in Japan, roughly for canning, sausage manufacturing, and consumption as fresh fish.

Taking 1961, for example, the exports of canned tuna totaled some 4 million cases, so tuna used for canning can be estimated at 80,000-100,000 tons. Because of the fact that more fishing is done in distant waters--the Atlantic, Indian Ocean, and Eastern Pacific--landings in Japan are not increasing so as to keep up with the demand for raw fish.

Under the circumstances, ex-vessel prices for raw tuna in Japan have advanced considerably and the available supplies are

not adequate to meet fully the demand. In August ex-vessel prices dropped somewhat, with the price of yellowfin at US\$314-\$319 per metric ton. At this price, packers of canned tuna are breaking about even.

The study by the tuna cannery association to find means to alleviate the shortage of raw tuna in Japan has not come up with any solution to date. One thing that is recognized is the need to find some way to encourage or increase landings in Japan. There is no agreement as to whether this should be accomplished by requiring the landing in Japanese ports of pelagic tuna vessels or by increasing the number of 39-ton tuna vessels fishing inshore waters. (Suisan Keizai Shimbun, August 24, 1962.)

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VIEWS ON NORTH PACIFIC HALIBUT RESEARCH:

Editor's Note: The following article on halibut research appeared in the Japanese fisheries periodical Suisan Keizai Shimbun, published in Tokyo, as part of a series of articles on Tripartite Fisheries Treaty problems.

It is widely known that the halibut resource and halibut fishery off the North American Continent (from northern California to the Bering Sea) have been successfully regulated internationally on the basis of research conducted by scientists and that, at the same time the Japan-United States-Canada Fisheries Treaty was concluded, Burkenroad's^{1/} critical views on the fluctuation of the Pacific halibut had already been published, but apparently, there was no objection to placing halibut on the abstention list.

In 1956, the United States and Canada, in accordance with the provisions of the Treaty, submitted reports to the International North Pacific Fisheries Commission, in which they stated that their halibut stocks continued to qualify for abstention. These reports were submitted together with the reports of the International Pacific Halibut Commission and a few other publications. The arguments presented by the United States and Canada and subsequent discussions on their views which developed are summarized as follows:

The United States report began by stating that the existing designation of regulatory
 1/Burkenroad, M. D., 1948, "Fluctuations in Abundance of Pacific Halibut," Bingham Oceanographic Collection Bulletin, vol. 11, pp. 81-129, New Haven, Conn.

Japan (Contd.):

areas was proper, based on such studies as tagging experiments, and it then proceeded to support this assertion by presenting an analysis of historical developments on the basis of statistical data on catch and catch effort, with respect to halibut stocks in Area 2 and Area 3. The report contains the following summarization:

"Increased fishing intensity since 1910 did not provide an increase in sustained productivity of halibut. Evidence of this fact had already been obtained prior to the institution in 1930 of the first international regulation on fishing intensity. Subsequent studies resulted in similar findings."

To present this matter a little more in detail, the United States claimed that, prior to 1930, an increase in catch effort was accompanied by a temporary increase in yield, but significantly, subsequent to 1930, the fishery was characterized by a progressive decline in catches to levels below earlier catches. Since the Thompson-Bell model closely coincided with these changes, the mechanism hypothesized in the model did actually work. In other words, the United States maintained that this distinctive phenomenon was created by a change in catch effort, and that the current success, which had been expected from the law of population dynamics, was achieved not by increasing catch effort but by reducing effort after 1930.

Against these assertions, Japan pointed out that: (1) the Thompson-Bell model is based on factors other than catch effort, such as increment, growth, natural mortality rate and gear efficiency, which should be considered as variables; thus, theoretically, these factors provide no proof that the mechanism functions; (2) in applying the theories contained in the United States report, the results to date do not support the American assertions that, as the halibut resource has recovered and increased, the amount of annually exploitable increment has increased.

With regard to factors other than effort, Japan pointed out that the study of stock fluctuations has shown that natural changes, particularly changes in increment, have contributed to past developments to a greater extent than catch effort. Thus, Japan maintained that the United States did not present sufficient evidence that her halibut stocks fulfilled the abstention requirements.

In 1959, the United States and Canada submitted reports containing statistical compilations on sustainable catch based on increment. In calculating these figures, the United States and Canada first of all attempted to estimate the natural mortality rate, growth rate, and fishing mortality rate on the basis of existing data. They then used these estimated values to conduct a series of calculations to arrive at the sustainable catch quantity based on increment. Based on these results, they claimed that their present halibut stocks have approached the level of maximum sustainable productivity.

The theory of sustained yield based on increment is based on the premise that the annual increment can be determined without regard to abundance (strictly speaking, the quantity of parent fish), and that the year-class group of the increment provides a preliminary standard on the catch rate that would yield maximum catch. Calculations based on this standard show a particularly high catch rate for Area 3, but the present catch rates in all fishing areas are too low. The United States and Canada claim that the differences in catch rates are negligible and maintain that their halibut stocks fulfill the requirements for abstention.

However, the biggest question is that this theory and the resultant calculations cannot by themselves explain the historical developments, which are complex phenomena, that have occurred since 1930. If the annual increment is determined to be entirely unrelated to abundance and is considered to be a problem related to catch rates only, then the problem of regulating the halibut fishery is an economic problem, which can be solved by permitting either a fewer number of efficient fishing vessels or a larger number of less efficient vessels to engage in this fishery. (Suisan Keizai Shimbun, August 30, 1962.)

Calculations made by the United States and Canada suggest a significant increase in increment since 1930, and their figures primarily reflect the annual increase in stock that can be utilized. Their (original) theory of halibut fishery management was to increase abundance so as to raise to a maximum the yearly increase in the stocks that can be utilized.

It is true that their halibut stocks have increased in abundance, but the United States and Canada have not explained as to what

Japan (Contd.):

level their resources will be considered to have reached a maximum, nor have they presented any evidence to support their claims that their stocks have now reached that level of abundance.

Reports so far submitted by the United States and Canada on the relationship between abundance and increment have merely stated the basic presumption that "increment reaches a maximum when abundance is at a certain level," and they have not yet presented any evidence to prove their assertions. Concerning this matter, the United States and Canada are said to be preparing new reports but, judging from the data that have been submitted, it may be difficult for those countries to provide any supporting evidence that will be acceptable.

The reason for this is that long-term fluctuations in the resource must be analyzed from a biological standpoint but, regrettably, contrary to expectations, biological data are somewhat meager. Most of the knowledge currently available concerning the ecology of halibut were obtained through investigations conducted before 1930. The inadequacies of the biological analyses performed on the data, which are based on the arbitrarily adopted and arbitrarily applied Thompson-Bell model, are glaringly apparent. In other words, the unbalanced selection of fishing grounds and the changes (fluctuations) accompanying these selections have created an ever increasing complex phenomena.

The reports submitted by the United States and Canada treat the Bering Sea halibut very briefly as a stock found in the fringes of Area 3. This was arrived at on the basis of early tagging experiments and, above all, on the basis of the smallness of the commercial halibut fishery in the Bering Sea.

In 1958, the United States and Canada submitted reports based on investigations conducted until 1956, and in those reports they insisted that the Bering Sea halibut were part of the halibut stocks in Area 3 and, at the same time, pointed out the necessity of conducting further studies on the Bering Sea halibut.

In 1959, the United States and Canada submitted papers on "Sustainable Catch Based on Increment," in which they mentioned that

the Bering Sea halibut (1956), as a virtually unutilized stock, were being used for the purpose of estimating the natural mortality rate of halibut.

At the annual meetings held in 1960 and 1961, Japan sought an explanation of the discrepancies and questionable points noted in the various reports presented earlier by the United States and Canada. For example, the expression "Bering Sea halibut" is used frequently in the report submitted by the United States and Canada, as well as those submitted by the Halibut Commission, but in many cases the statements were too brief to clarify the actual state of this stock. Moreover, the regulatory areas, Area 4, Area 3A and Area 3B, have been reorganized and this has served to further complicate matters.

However, the following two findings are important biologically. One is that a comparison of the average body weight by age group of halibut taken in the fishing grounds extending from Cape Spencer to the Bering Sea showed marked differences in values within the wide age group of halibut taken in the Bering Sea from those taken in the waters east of the Shumagin Islands in Area 3. The other is that the average body size by age group of halibut taken in the fishing grounds within Area 3 east of the Shumagin Islands showed practically no differences in value.

Halibut are known to migrate extensively as they mature. If they are to be identified as a single stock due to their migration and intermingling, then there should be a more uniform average body weight by age group.

Tag recoveries show that the fishing effort in the Bering Sea west of the Trinity Islands in Area 3 was indeed low. In view of this situation, it may be necessary to make a more thorough adjustment in determining the dividing line between the stock in the eastern part of Area 3 and the stock in the western extremity of that area. There is no denying the fact that this matter is not as simple as the United States and Canada claim it to be.

The present voluntary abstention conditions seem to have been established on the basis of experiences gained from the regulation of the halibut fishery. Superficial observations of the changes that have occurred in catch quantities and catch effort during the 50 years since 1910 seem to indicate that the halibut fishery literally satisfies the abstention conditions stipulated in the Tripartite Fisheries

Japan (Contd.):

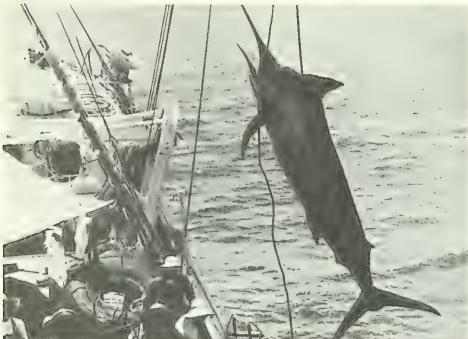
Treaty. However, the study and analysis of historical developments from the biological standpoint reveal the existence of problems (assumptions) which have not been substantiated and which, at the present time, may be practically impossible to prove.

The abstention conditions, which seek to establish a sustainable yield, involve the problem of regulating fishing intensity and the problem of determining the necessity of regulating effort. However, these two problems concern matters related to resources, abundance, and economics. From a commercial standpoint, the greater the abundance, the less effort will be required to produce the necessary catch. In this sense, the regulation of the halibut fishery has actually produced the desired results. However, there is no clear scientific evidence to support the assertions that this regulation will ultimately increase abundance or that it will show such prospects. (Suisan Keizai Shimbun, August 31, 1962.)

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FROZEN SWORDFISH EXPORTS TO UNITED STATES:

Frozen swordfish exported to the United States from April 1, 1962 (beginning date of Japanese fiscal year) to October 1, 1962, totaled 3,036 short tons. This is according to data compiled by the Japan Frozen Foods Exporters Association. Exports during the same period the previous year were 2,750 short tons.



Hauling in a swordfish aboard a Japanese catcher vessel.

Sales of swordfish in the United States were reported good during 1962. Wholesalers' inventories at New York City and Boston as of September 6, 1962, were reported slightly lower than at the same time a year earlier. (Shin Suisan Shimbun Sokuhō, October 3, 1962.)

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FROZEN OCTOPUS EXPORTS TO U. S. AND CANADA:

Japanese exports of frozen octopus to the United States and Canada have been favorable this season. Nearly 1,700 short tons were shipped during the season (February-July), almost twice as much as last season. Also, the price has been about 23 cents a pound c.&f., an increase of 20 percent from last season.

Frozen octopus is used as bait for halibut fishing in Canada and Alaska. (Suisan Tsushin, August 6, 1962.)

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FISH MEAL FACTORYSHIP TO OPERATE OFF ANGOLA:

The Japanese fish meal factoryship Renshin Maru (14,094 gross tons) was expected to return to Japan from the eastern Bering Sea bottom fishing grounds on or about October 10, 1962. Upon its return, the factoryship was to be refitted and dispatched around November 1 to Angolan waters, where it will process fish (delivered by Angolan fishing vessels) into fish meal on a contract basis, like it did in 1961. (Suisan Tsushin, Japanese periodical, September 22, 1962.)

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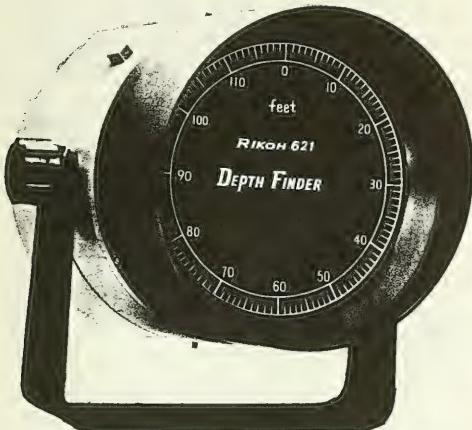
TRANSISTORIZED DEPTH-FINDER DEVELOPED BY JAPANESE FIRM:

Six flashlight dry batteries or a storage battery will operate a new Japanese transistorized depth-finder. The manufacturer claims the new depth-finder (with a total weight of only six pounds) will measure depths up to 120 feet with a margin of error of less than 2 percent. The manufacturer also states that the instrument may locate schools of fish. It is priced at 28,000 yen (US\$77.77) f.o.b. Japan.

The transistorized depth-finder consists of an indicator 6 inches in diameter and $7\frac{1}{2}$ inches long, plus a separate transducer $1\frac{3}{4}$ inches in diameter and $4\frac{3}{4}$ inches long. Sound-

Japan (Contd.):

ings are taken at the rate of 1,200 per minute. Neon flashes on the dial of the indicator show the depth of water. Intermittent neon flashes on the dial show a school of fish.



The transducer is designed to be attached to the bottom of a boat. But it may be attached to the side of a boat by the use of a vinyl tube and C-clamp. The C-clamp for use with the depth-finder is an extra cost item that will be supplied by the manufacturer upon request. The transducer should be submerged at least 10 inches in the water and placed so that it will be vertical to the sea surface when the boat is running. (Fisheries Attaché, United States Embassy, Tokyo, September 19, 1962.)

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STERN TRAWLER LAUNCHED:

The large stern trawler Taiyo Maru No. 73 (1,500 gross tons), ordered by a large Japanese fishing company, was launched in Shimonoseki, Japan, in September 1962. The vessel is equipped with the most modern electronic equipment, such as fish-finder, radar, and loran. Delivery was expected to be made around the end of November 1962.

Specifications of the vessel are: Length, 227.7 feet; beam, 38.9 feet; draft, 18.8 feet; power plant, 2,000 hp. Diesel engine; speed, 14 knots. (Minato Shimbun, September 29, 1962.)

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CONSIDERS RUSSIAN TRAWL FISHING METHODS IN GULF OF ALASKA OUTDATED:

The Japanese Fisheries Agency and the Japanese fishing industry reportedly consider the trawl fishing methods employed by the Soviet Union in the Gulf of Alaska as being very crude and far inferior to the methods presently employed by the Japanese trawl fleet.

Information concerning the Russian trawl gear was supplied to the Japanese Fisheries Agency by the U. S. Department of State following the interim meeting of the International North Pacific Fisheries Commission held at Honolulu in August 1962. At this meeting, the United States delegation made reference to the Soviet trawl gear, which was reported to be constructed and operated in such a way that it did not take halibut. Japan requested that she be provided with data concerning the Russian trawl.

The data supplied by the United States indicated that the Russians used 40-pound sinkers attached to 12 drop lines, which are fixed to the bottom entrance of the trawl. The 12 sinkers serve to keep the trawl near the bottom but at predetermined heights off the bottom, depending on the length of the drop lines. Reportedly, the Japanese consider the use of sinkers to hold down a trawl near the bottom an outdated technique. (Shin Suisan Shimbun Sokuho, September 21, 1962.)

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MORE JAPANESE VIEWS ON SECOND UNITED STATES-JAPAN TUNA MEETING:

The second Japan-United States tuna meeting convened in Tokyo on October 9, 1962. The editorial column of the Japanese fisheries periodical Suisan Keizai Shimbun, of October 11, 1962, in part, had this to say about the meeting:

The Japanese tuna industry awaits the outcome of the second tuna meeting with great expectations. The Japanese delegates have generally agreed to develop the following four points during the meeting: First, Japan will actively cooperate in international investigations of tuna resources in the Indian and North Pacific Oceans. Second, Japan will seek participation in the Inter-American Tropical Tuna Commission since she naturally should take part in the yellowfin tuna regulatory program in the eastern Pacific Ocean. Third, Japan will seek clarification of the canned tuna market situation in the United States, where a supply shortage estimated at 150,000 cases reportedly exists despite restrictions applied on canned tuna imports by the United States by means of tariff quota. Fourth, Japan will observe the attitude of the United States and will strive to bring about a better understanding among the Americans of Japan's desires and intention.

Japan and the United States must understand each other's position with respect to tuna trade, says the periodical. Unnecessary trade restrictions can be removed and Japan can supply the deficiency. It is hoped that the development of Japan's fishing industry and tuna export trade will result in further promoting friendly trade relations between Japan and the United States.

Japan (Contd.):

Japan, which is now virtually the world's leading supplier of tuna, must participate in the joint investigation of resources with dignity, confidence, and firmness of purpose.

The Japanese periodical *Suisan Tsushin* of October 13 and 15, 1962, reported in part:

The tuna conference was primarily an exchange of views by both countries on known problems related to tuna fisheries, with no particularly new topic being introduced for discussion. During the subcommittee meetings held on October 10 and 11, fairly pointed views were exchanged between the delegations of both countries in regard to investigation of resources and trade problems. Reportedly, Japan presented more data on resources than did the United States, but the United States delegation is reported to have stated that "Various countries are conducting investigations of resources in the Atlantic Ocean, so Japan should also cooperate in those investigations rather than just take fish. Catch data alone cannot be considered investigations." Japan stated that she would hereafter prepare catch data covering smaller areas. Regarding trade problems, the United States delegation stated that Japan has considerably expanded her trade, due to the rapid increase in tuna catches taken by her fishermen. In reply, the Japanese remarked, "United States packers have established canneries in South America with American capital for production of tuna packed in brine, and they are importing the South American production into the United States under the tariff quota which permits imports of tuna packed in brine up to an amount corresponding to 20 percent of total United States canned tuna production for the previous year. Imports of tuna packed by United States-managed plants should be excluded from this tariff quota."

Both Japan and the United States agreed that this meeting was beneficial to the two countries. Summarized below are the subcommittee meetings held on October 10 and 11.

1. The meeting of Subcommittee I focused attention on the problem of conserving the tuna resources. Reports on investigations of resources conducted by both Japan and the United States were presented by the delegates of the two countries. The United States delegation presented various data on which the United States based her yellowfin tuna catch regulation to be enforced in the eastern Pacific Ocean. In connection with the yellowfin tuna regulatory problem, the Japanese delegation reported that the tuna vessels of Japan were instructed to submit catch data to the Government and that, Japan, although she is still studying measures to be applied after the yellowfin catch quota is filled, intends to render all possible cooperation to the United States Government in regulating yellowfin tuna catches. The United States delegation expressed its desire of extending the present eastern Pacific Ocean tuna investigation program to the waters of the South Pacific Ocean, the Indian Ocean, and the Atlantic Ocean.

2. The meeting of Subcommittee II primarily dwelled on the theme of expanding the utilization of tuna products and of expanding the tuna trade. Concerning United States imports of canned tuna, the Japanese delegation reportedly presented the following inquiries: (a) Is it not unreasonable for the United States to exclude the Samoan production in the total United States canned tuna production, which forms the basis in computing the United States tariff quota on imports of canned tuna in brine? (b) Why does the United States impose such a prohibitive tariff of 35 percent on her imports of tuna packed in oil?

To these questions, the United States delegation is reported to have replied substantially as follows: (a) The U.S. Tariff Act specifically states that Samoa, Wake Island, Midway Island, and three other United States territories are not considered a part of the United States mainland; (b) at the price which Japan exports canned tuna in oil to European countries, she should be able to sell tuna packed in oil to the United States even if a 35-percent tariff is imposed. (*Suisan Tsushin*, October 13 and 15, 1962.)



Kuwait

SHRIMP PRODUCING POTENTIAL SURVEYED BY UNITED STATES FIRM:

The Saudi Fishing Company, Ltd., in January 1962, observed its tenth year as exclusive concession holder for fishing in all Saudi Arabian waters of the Persian Gulf. Its first attempt at establishing a coordinated fishing industry in the Red Sea area failed. But it has granted a subconcession to an enterprising frozen foods distributor in the Eastern Province who negotiated and signed contracts with a United States firm for surveys of the Persian (Arabian) Gulf. Two trawlers owned by the United States firm were en route from Pakistan the latter part of this past summer to conduct a shrimp survey in Persian Gulf waters off the Eastern Province of Kuwait.

The frozen foods facility at Dammam in the Eastern Province is managed by a United States national who estimated the chances for success resulting from the new joint venture as very high. Several approaches toward contract negotiations for a joint venture had been made earlier this year by other United States firms.

The frozen foods distributor at Dammam has already installed a small pilot shrimp freezing plant which is to be used in the survey. The plant will be expanded if shrimp are found in quantity. No financial details of the subconcession were given, but the terms were believed to be attractive to the concessionaire.

Shrimp fishing has been successful in Kuwait. For this reason, the joint venture is regarded as a logical alliance between an experienced United States firm and an established Saudi freezer plant operator. (United States Embassy, Kuwait, September 1, 1962.)



Mexico

WEST COAST 1962/63 SHRIMP FISHING SEASON DELAYED BY VESSEL TIE-UP:

The new shrimp fishing season on Mexico's west coast did not start on September 15, 1962, as originally scheduled, due to a vessel tie-up over contract negotiations. Fishing vessels were all set to start on that date, but at the last minute, boat owners and the cooperatives (who have exclusive rights to the catching of shrimp in Mexico) failed to agree on a new contract. This resulted in some 200 vessels being tied up. The loss to the shrimp industry because of the tie-up was estimated at 6 million pesos (US\$480,000) a day, and affected Mexico's Pacific Coast shrimp fishery from Salina Cruz to Puerto Penasco.

Mexico (Contd.):

As of September 26, 1962, the major dispute between the boat owners and the cooperative fishermen appeared to be on the 45 percent share demanded by the cooperatives. Although Mexican west coast shrimp vessels were then fishing, the tentative agreement reached on September 22 was not final, and it was feared that fishing again would stop. The cooperatives want 45 percent of the entire catch; the boat owners are willing to give only 45 percent of the net sales return above a cost figure of about \$1,400 a metric ton for Guaymas, and about \$1,440 for Mazatlan. For example, if a metric ton of shrimp from Guaymas netted \$1,700 on the United States market, the cooperative would get \$135, or 45 percent of the difference between \$1,700 and \$1,400.

In addition, it was reported that the boat owners were willing to pay the fishermen a flat \$360 a metric ton for heads-off shrimp, and to pay all boat operation costs including food. But agreement on that point had not been reached. Reports were that the fishermen wanted a premium price when shrimp landings exceeded a specific quantity.

The last contract agreed on by the cooperatives and boat owners expired August 31, 1962, and the dispute which was still in force later in September was the result of contract negotiations between the boat owners who are represented by the National Chamber of the Fishery Industries, and the cooperatives which are represented by themselves and the Mexican Government. The negotiations began with the cooperatives wanting to take charge of the marketing of the entire catch and paying the boat owner 10 percent of the net profits. Later, the negotiations settled around the points mentioned above, and that developed toward the latter part of September.

When negotiations on a new contract for the coming season began in August, it was expected that the price to the cooperatives would be increased based on higher living costs. But before an agreement was reached, word was received from the Confederacion Nacional de Cooperativas de la Republica Mexicana (National Federation of Cooperatives), that the new contract should provide that the boat owners must fully outfit the vessel as was done the previous year. The cooperatives were assigned certain expenses which the boat owners stipulated should not exceed 25 percent, with the balance of the expenses to be borne by the boat owners. The gross catch was to be equally divided between boat owners and cooperatives.

The shrimp fishing fleet, consisting of some 200 vessels, was being provisioned and getting ready to sail on September 15. Ship suppliers had accumulated large quantities of perishable foods such as meat, eggs, and vegetables, which they planned to load aboard the refrigerated vessels before their departure. Those suppliers had no cold-storage facilities and their loss because of the delayed sailing date was considerable. Expecting that the order to sail might come at any day, additional ice was placed in the boats so that they could leave on short notice with a full supply.

Shrimp fishing in Mexico has been reserved for the cooperative fishermen since the middle of 1940, and until recent years the majority of the shrimp vessels were privately owned, but operated by cooperative fishermen on a contractual basis approved by the Government.

The shrimp industry, including fishing, freezing, and exporting shrimp, is the most important factor in Mazatlan's economy. The 1961/62 shrimp fishing season was unusual in that landings were heavier than they normally are, and prices on the United States market were higher than usual. July through September 15, 1962, was the closed season for Mexico's west coast shrimp fishery. During the closed season to shrimp fishing, freezing plants are cleaned, machines and equipment are overhauled, and the boats are put into shape for the new fishing season. After that two-months period of idleness, it was anticipated that the vessels would sail about mid-September as usual, and possibly repeat the good shrimp landings of the previous season.

As far as Mexico's fishing operations in international waters are concerned, it has been pointed out by observers that those waters provide 70 percent of the shrimp landed at Mazatlan. Their thinking is that if the vessel tie-up were to continue, United States shrimp vessels could well come into that area and take full advantage of the existing deadlock in Mexico's west coast shrimp fishery.

The Mexican cooperatives have had a virtual monopoly on Mexico's shrimp fishing industry since the late 1930's when it was decreed by the Government that the cooperatives only could fish for shrimp in national waters. The cooperatives, which almost without exception own no fishing vessels, operate them with the boat owners who are known as "armadores." A two-year contract, signed in August 1960, stated that the boat owners were to provide boats fully equipped with tackle, ice, provisions, and with vessel engines that were satisfactory to the vessel's engineer. The crews went aboard with only their personal effects. The boat owners paid the captains an average of 50 pesos (US\$4.00) a day, the engineers 40 to 50 pesos a day, and also paid the cooks whose pay varied widely. In addition to wages, the 3 crew members would receive a bonus if the boat returned to port with more than 3 tons of shrimp. The bonus varied with the size of the catch. The rest of the crew were paid by the cooperatives.

The boat owners paid the cooperatives 3,040 pesos (\$243) a ton for the catch which was delivered to the freezing plants for processing and packing on a fee basis. During the 1961/62 fishing season, the cost of the processing and packing operation was about 1,750 pesos (\$140) a ton which included the cost of the waxed cardboard container. The boat owner received an estimated average price of 20,000 pesos (\$1,600) a ton for his shrimp.

The "armadores" or boat owners have an estimated investment of 400,000 pesos (\$32,000) in each vessel. New vessels are now estimated to cost 560,000 pesos (\$44,800) each. The size of the boat owner's investment, plus operating and maintenance costs, precluded their acceptance of the contract terms offered in August 1962 by the cooperatives. According to law, the boat owners are not to fish for shrimp in Mexican waters. They could possibly go out beyond the Mexican territorial fishing limits and fish there, but such a move could result in some sort of duty or penalty charge which would make the landing of shrimp an economic impossibility. It was suggested that such vessels might fish in international waters and take their catch to other countries, such as Guatemala, for processing. It was doubted that such action would be taken by any of the vessels as a solution to the problem. Boat owners might be agreeable to selling their vessels to the cooperatives, but these do not have the money to buy them.

Mexico exported slightly more than 79 million pounds of shrimp to the United States in 1961. Mazatlan's shrimp industry exported about 22 million pounds of shrimp that year at prices of from 75 to 80 cents a pound, representing earnings of about \$17 million.

Contracts for the building of 11 new fishing vessels in Mazatlan were cancelled in September. (United States Consulate, Mazatlan, dispatch, September 21, 1962; United States Embassy, Mexico City, dispatch dated September 27, 1962.)



Portugal

CANNED FISH EXPORTS, JANUARY-JUNE 1962:

Portugal's total exports of canned fish during the first half of 1962 were 3.8 percent greater than in the same period of 1961. Sar-

Portugal (Contd.):

dines accounted for 82.3 percent of the 1962 exports of canned fish, followed by anchovy fillets with 9.2 percent.

Portugal's principal canned fish buyers in the first half of 1962 were Germany with 6,251 metric tons, followed by the United Kingdom with 4,506 tons, the United States with 3,718 tons, Italy with 2,896 tons, and France with 2,283 tons.

Product	January-June 1961-1962			
	1962		1961	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
In Oil or Sauce:				
Sardines	25,102	1,321	24,212	1,274
Chinchards	719	37	791	41
Mackerel	614	24	278	11
Tuna and tuna-like	1,125	37	1,258	45
Anchovy fillets	2,813	281	2,699	270
Others	131	7	140	9
Total	30,504	1,707	29,378	1,648

In June 1962, Portugal's canned fish exports to the United States consisted of 237 tons of sardines, 238 tons of tuna, 93 tons of anchovy fillets, and 3 tons of other species. (Conservas de Peixe, August 1962.)

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**CANNED FISH PACK,
JANUARY-JUNE 1962:**

Portugal's total pack of canned fish in oil or sauce for the first half of 1962 was 4.7 percent greater than in the same period of 1961. The sardine pack accounted for 63.7 percent of the total pack, followed by anchovy fillets with 18.3 percent of the total. There were increases in 1962 in the pack of sardines (up 15.4 percent), chinchards, and anchovy fillets. But the pack of tuna dropped 44.1 percent and the pack of mackerel also declined.

Product	January-June 1961-1962			
	1962		1961	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
In Oil or Sauce:				
Sardines	10,746	565	9,314	490
Chinchards	1,289	68	641	34
Mackerel	188	7	533	21
Tuna and tuna-like	1,466	49	2,621	94
Anchovy fillets	3,081	368	2,842	285
Others	108	5	164	9
Total	16,878	1,002	16,115	933

During the first half of 1962 sardine landings amounted to 23,801 metric tons, up 14.2

percent from sardine landings of 20,847 tons in the same period of 1961. (Conservas de Peixe, August 1962.)

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MODERN FISHING BASE PLANNED:

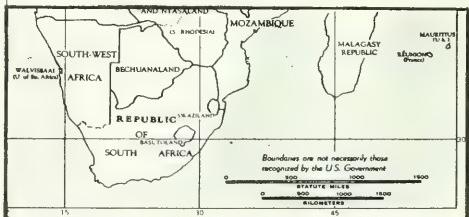
A fishing base with modern equipment for handling tuna and other fish is planned for Sao Vicente in the Cape Verde Islands by Portuguese and German interests. The base will have freezing and preserving machinery, equipment for processing fish meal and oil, a saline water conversion unit, modern laboratory, and a community recreation center.

The cost of building the fishing base in the Cape Verde Islands in the Atlantic Ocean several hundred miles west of Dakar (West Africa) and the cost of acquiring several modern tuna vessels will amount to \$8,750,000. The major part of the financing will be provided by German interests on a deferred credit basis and most of the equipment will be of German origin. It is believed that Portuguese interests will assume responsibility at the base for the actual construction and fishing operations. (United States Embassy, Lisbon, September 14, 1962.)

**South Africa Republic****PLANS TO EXTEND TERRITORIAL
FISHING LIMITS TO 12 MILES:**

The Government of the South Africa Republic intended to ask the South African Parliament at its last session to extend the territorial fishing limits to 12 miles. But according to a member of the Parliament, there had not been sufficient time to introduce such legislation and it is the Government's intention to do so at the next session.

The Senator making the announcement said that South Africa would be forced to take



South Africa Republic (Contd.):

this action since many other nations had already declared such territorial fishing limits. He added that, in fact, two-thirds of the countries bordering on the sea already had a 12-mile fishing limit. He further contended that several other countries, including the Soviet Union, were showing great interest in the fishery resources off South and South-West Africa, and that it was the Government's duty to protect the country's interests.

It was generally felt that the presence of Soviet fishing vessels operating close to the South-West African coast generated the demand for the extension of territorial fishing limits. (United States Consulate, Cape Town, August 10, 1962.)

**Switzerland****JAPANESE CANNED TUNA PRICES,
MID-SEPTEMBER 1962:**

In mid-September 1962, the prices paid by Swiss importers for Japanese solid pack canned tuna in oil were:

F.O.B. Japan: White Meat (48 7/8-oz. cans): Fancy A	\$ 9.70 a case
Fancy B	\$ 9.45 a case
<hr/>	
C. & F. European Ports: White Meat: (48 7/8-oz. cans)	\$10.25 a case
(48 3 1/2-oz. cans)	\$ 5.78 a case
(24 13-oz. cans)	\$10.00 a case
(6 6 1/2-oz. cans)	\$11.40 a case
<hr/>	
Light Meat: (48 7/8-oz. cans)	\$ 7.19 a case
(48 3 1/2-oz. cans)	\$ 4.17 a case
(24 13-oz. cans)	\$ 7.26 a case
(6 6 1/2-oz. cans)	\$ 8.25 a case

(United States Embassy, Bern, September 18, 1962.)

**Saudi Arabia****AUTHORIZES IMPORT OF
JAPANESE CANNED SAURY:**

The Egyptian Government has reportedly issued a new import license to an Egyptian company, authorizing that company to import Japanese products during October 1962 to March 1963, according to information received by Japanese exporters. The company is reported to be planning on importing around US\$600,000 worth of canned saury and other canned fish products from Japan, and is expected to open negotiations with Japa-

nese firms shortly. (Suisan Tsushin, October 3, 1962.)

**United Kingdom****FISHERY LOANS INTEREST
RATES REVISED:**

The British White Fish Authority announced that, as a result of a change in the rates of interest charged to them by the Treasury, their own rates of interest on loans made as from August 18 will be as follows:

Fishing vessels of not more than 140 feet, new engines, nets and gear: on loans for not more than 5 years, $5\frac{1}{4}$ percent, decrease $\frac{1}{8}$ percent; on loans for more than 5 years, but not more than 10 years, $5\frac{3}{4}$ percent, decrease $\frac{1}{8}$ percent; on loans for more than 10 years, but not more than 15 years, $6\frac{1}{4}$ percent, decrease $\frac{1}{8}$ percent; on loans for more than 15 years, but not more than 20 years, $6\frac{1}{2}$ percent, decrease $\frac{1}{8}$ percent.

Processing plants: on loans for not more than 20 years, $7\frac{3}{8}$ percent, decrease $\frac{1}{8}$ percent.

The rates on loans made before August 18 are unchanged.

Note: See Commercial Fisheries Review, September 1962 p. 109.

**Venezuela****JAPANESE FISHING FIRM NOT ABLE
TO ROTATE TUNA TECHNICIANS
IN VENEZUELA:**

The Chiba Prefectural Fisheries Promotion Company, a Japanese firm which jointly established a fishing company in Venezuela three years ago with a Venezuelan firm, is reportedly encountering difficulty in rotating its technical personnel stationed in Venezuela.

In 1959 and 1960, the Japanese company dispatched a total of 52 Japanese technicians to Venezuela to operate tuna vessels for the joint enterprise and to provide technical assistance. Of those 52 technicians, 16 who had fulfilled their three-year contracts returned to Japan in August 1962 and the Japanese company was planning to send 10 replacements to Venezuela. However, a hitch de-

Venezuela (Contd.):

veloped in this plan due to the Venezuelan Government's failure to approve the entry of the replacements. Reportedly, the Venezuelan Government's action to withhold approval was based on the law of that country which limits admission of non-Caucasian nationals into Venezuela. The Japanese company does not think that Venezuela intends to prohibit entry of Japanese nationals and is expecting

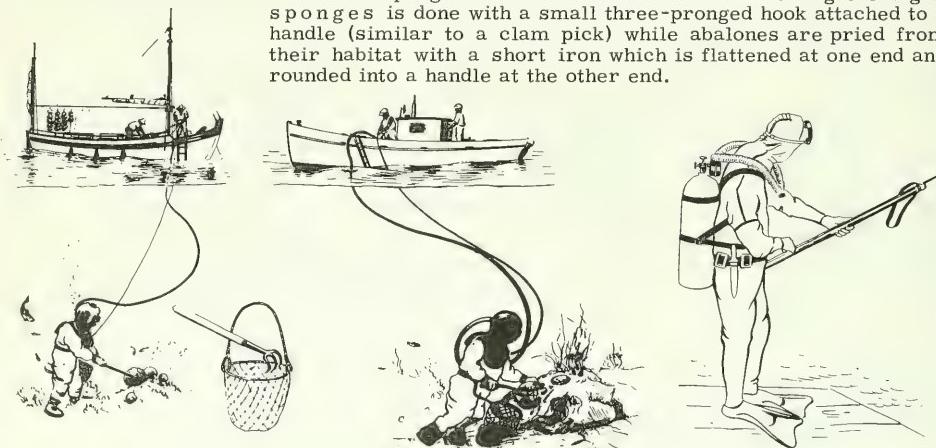
a formal announcement to be made on this matter by the Venezuelan Government.

The joint Japanese-Venezuelan fishing company was established with a capital investment of 100 million yen (US\$278,000) and three vessels (two 90-ton and one 300-ton vessels) invested by the Japanese company. This joint company now has a fleet of seven tuna vessels operating in the Caribbean Sea, which in 1961 landed a total of 770 metric tons of fish. (Susan Keizai Shimbun, September 25, 1962.)

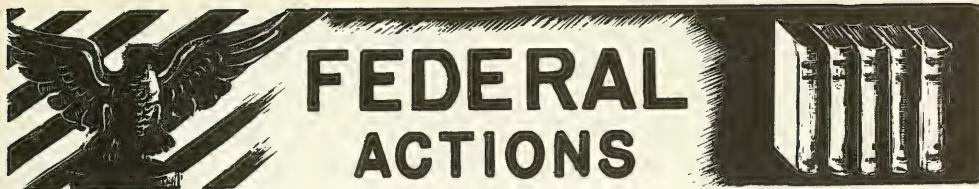


DIVING OUTFITS

A diving outfit may consist of a face mask supplied with air from a tank carried on the back of the diver, or a regular diving suit which encases the diver and is supplied air by a pump on the deck of a vessel. The first method, commonly called a skin diving outfit, is used in capturing fish or shellfish with a spear or bow gun. The regular diving outfit is used in the sponge and abalone fisheries. The actual gathering of sponges is done with a small three-pronged hook attached to a handle (similar to a clam pick) while abalones are pried from their habitat with a short iron which is flattened at one end and rounded into a handle at the other end.



Note: Excerpt from Circular 109, Commercial Fishing Gear of the United States, for sale from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., single copy, 40 cents.



FEDERAL ACTIONS

Department of Commerce
AREA REDEVELOPMENT ADMINISTRATION
**INDUSTRIAL LOAN TO MAINE
FISHERY FIRM APPROVED:**

A \$275,000 Industrial loan to aid expansion of Forty-Fathoms Fisheries, Inc., at Rockland, Maine, has been approved by the Area Redevelopment Administration (ARA) of the U. S. Department of Commerce. The firm's expansion project will create 26 new jobs, according to the ARA announcement of September 14, 1962. The ARA loan, repayable over a 15-year period and bearing an annual interest rate of 4 percent, will finance only part of the fishery firm's \$425,000 expansion project. Additional support has been obtained from a local nonprofit organization known as Knox Industries, Inc., which will contribute \$60,000, and a bank in Portland, Maine, which will invest \$60,000. Forty-Fathoms Fisheries is putting \$30,000 of its own funds into the project.

The money will be used to buy land, construct a new building for frozen fish storage, and purchase machinery and equipment. The 26 new jobs created by the expanded facilities will add about \$90,000 a year to the firm's local payroll. New facilities will also allow diversification and the addition of a fish stick and fish portion unit which will help place operations on a year-round rather than a seasonal basis. The firm now employs about 300 people in Rockland.

Rockland is in Knox County, Maine, which was designated as eligible to participate in the Area Redevelopment program because of persistent and substantial unemployment.

The Small Business Administration investigated the project and conducted negotiations which led to approval of the loan by ARA. The U. S. Bureau of Commercial Fisheries recommended approval of the loan subject to adequate safeguards that purchase of domestic fish would not be abandoned. Forty-

Fathoms Fisheries, Inc., of Rockland is a subsidiary of Ocean Fisheries, Limited, Halifax, Nova Scotia.

* * * * *

**INDUSTRIAL LOAN TO WASHINGTON
OYSTER FIRM APPROVED:**

A \$110,000 industrial loan to a Washington State oyster firm has been approved by the Area Redevelopment Administration (ARA) of the U. S. Department of Commerce. The loan will help provide 40 new year-round jobs in Nahcotta, Wash., where job opportunities are limited. The ARA announcement of September 5, 1962, pointed out that unemployment in this community of 5,756 people averaged 11.6 percent of the work force in 1961.

The loan, repayable over a 12-year period and bearing an annual interest rate of 4 percent, will be made to the Northwest Oyster Farms, Inc., of Nahcotta. The firm plans to expand its oyster farming and processing operations in a project that will cost \$171,623. Additional financing has been obtained from a nonprofit organization known as Pacific County Development Co., which is contributing \$17,162 and a bank in Ilwaco, Wash., which is investing \$9,699. Northwest Oyster Farms is putting \$34,762 of its own funds into the expansion project.

The money will be used to purchase a plant, specialized machinery and equipment, and an oyster-harvesting dredge. The company now holds leases on 1,000 acres of oyster tidelands. In addition to harvesting and canning fresh oysters, the company will process and can smoked and "casserole" oysters. It will also do custom processing for other companies. The firm plans to market its canned oysters nationwide, thereby putting its operation on a year-round rather than seasonal basis.

Nahcotta is in Pacific County, Wash., which was designated as eligible to participate in

the Area Redevelopment program because of substantial and persistent unemployment and underemployment. The Small Business Administration investigated the feasibility of the Nahcotta project and made recommendations on which ARA's approval of the loan was based. The Nahcotta project has also been approved by the U. S. Bureau of Commercial Fisheries.



Department of Health, Education and Welfare

FOOD AND DRUG ADMINISTRATION

CANNED TUNA LABELS MUST SAY "LIGHT" OR "DARK."

Canned tuna prepared from dark meat must be labeled "dark," and tuna packed in water instead of oil must be labeled to show the words "in water" as a part of the name, according to a food standards ruling published by the Food and Drug Administration. The new labeling requirements were made final after a review of objections to a tentative order published March 31, 1961, based on evidence presented at public hearings.

Lighter colored canned tuna is generally considered more desirable and there have been consumer complaints in the past because rather dark tuna was labeled "light," the agency said. Under the standard, tuna will be required to be labeled "white," "light," or "dark." In the case of blends of light and dark tuna, the label will show both color designations. Color designations are determined by measurements made on a special optical instrument.

One of the issues for the hearing was whether dark meat tuna should be so labeled. One packer objected to a label designation of certain dark portions of the meat as "dark," and proposed instead that the product be labeled simply as "tuna." However, a majority of more than 4,000 consumers interviewed were interested in whether the tuna they serve is light or dark tuna, and substantially all of them wanted the labels to give this information.

The other issue dealt with in the hearing was whether the label of water-packed tuna should bear the words "in water." Objectors asserted that the oil in oil-packed tuna is discarded and is not an edible part of the contents. However, the consumer survey showed that more than half of those answering always or sometimes use the oil. It was concluded that consumers are interested in knowing whether the tuna they buy is the conventional oil-pack, or is tuna packed in water.

This conclusion as stated in the tentative order was challenged by distributors of water-packed tuna imported from Japan. Restudy of the hearing record resulted in revision of the findings of fact. However, the revisions did not alter the ultimate conclusion that consumer interests are best served by retaining the requirement that the words "in water" be included in the name on labels of water-packed tuna.

The new labeling requirements become effective on January 5, 1963, and complete the official definitions and standards of identity for tuna. These definitions and standards cover composition, fill of container, and labeling of canned tuna fish.

Note: See Commercial Fisheries Review, October 1962 p. 69.

* * * * *

USE OF HYDROGENATED SPERM OIL PERMITTED AS FOOD ADDITIVE:

The food additive hydrogenated sperm oil as a release agent or lubricant in bakery pans may be safely used under certain conditions. The amendment to the food additive regulations providing for this change as published by the Food and Drug Administration in the October 16, 1962 Federal Register follows:

Title 21—FOOD AND DRUGS

Chapter I—Food and Drug Administration, Department of Health, Education, and Welfare

SUBCHAPTER B—FOOD AND FOOD PRODUCTS

PART 121—FOOD ADDITIVES

Subpart D—Food Additives Permitted in Food for Human Consumption

HYDROGENATED SPERM OIL

The Commissioner of Food and Drugs having evaluated the data submitted in a petition (FAP 761) filed by Archer-Daniels-Midland Company, 733 Marquette Avenue, Minneapolis 40, Minnesota, and other relevant material, has concluded that the following regulation should issue with respect to the food additive hydrogenated sperm oil as a release agent or lubricant in bakery pans. Therefore, pursuant to the provisions of the Federal Food, Drug, and Cosmetic Act (sec. 409(c)(1), 72 Stat. 1786; 21 U.S.C. 348(c)(1)), and under the authority delegated to the Commissioner by the Secretary of Health, Education, and Welfare (25 F.R. 3625), the food additive regulations (21 CFR Part 121) are amended by adding to Subpart D the following new section:

§ 121.1101 Sperm oil, hydrogenated.

The food additive hydrogenated sperm oil may be safely used in accordance with the following prescribed conditions:

(a) The sperm oil is derived from rendering the fatty tissue of the sperm whale or is prepared by synthesis of fatty acids and fatty alcohols derived from the sperm whale. The sperm oil obtained by rendering is refined. The oil is hydrogenated.

(b) It is used alone or as a component of a release agent or lubricant in bakery pans.

(c) The amount used does not exceed that reasonably required to accomplish the intended lubricating effect.

Any person who will be adversely affected by the foregoing order may at any time within 30 days from the date of its publication in the FEDERAL REGISTER file with the Hearing Clerk, Department of Health, Education, and Welfare, Room 5440, 330 Independence Avenue SW., Washington 25, D.C., written objections thereto. Objections shall show wherein the person filing will be adversely affected by the order and specify with particularity the provisions of the order deemed objectionable and the grounds for the objections. If a hearing is requested, the objections must state the issues for the hearing. A hearing will

be granted if the objections are supported by grounds legally sufficient to justify the relief sought. Objections may be accompanied by a memorandum or brief in support thereof. All documents shall be filed in quintuplicate.

Effective date. This order shall be effective on the date of its publication in the **FEDERAL REGISTER**.

(Sec. 409(c)(1), 72 Stat. 1786; 21 U.S.C. §48(c)(1))

Dated: October 10, 1962.

GEO. P. LARRICK,
Commissioner of Food and Drugs.



Department of the Interior

FISH AND WILDLIFE SERVICE

BUREAU OF COMMERCIAL FISHERIES

PROPOSED YELLOWFIN TUNA CONSERVATION REGULATIONS FOR EASTERN PACIFIC:

"An unprecedented advance in safeguarding the world's marine resources--protecting a resource before it has been seriously damaged by overutilization--was made this week when President Kennedy signed a bill to protect and conserve the yellowfin tuna," Acting Secretary of the Interior James K. Carr said on October 19, 1962.

The bill amends the Tuna Convention Act of 1950. Regulations implementing it were published in the Federal Register of October 18.

"This broad new international conservation effort of the Administration carries out the recommendations of the Inter-American Tropical Tuna Commission, an investigative body established by the Tuna Convention of which the United States, Costa Rica, Panama, and Ecuador are members," Acting Secretary Carr explained. "Scientific evidence collected by the Commission indicated that unless the yellowfin tuna fishery in the eastern tropical Pacific Ocean was regulated at once the yield might be seriously reduced."

The bill signed by President Kennedy was introduced in Congress by Senator Warren G. Magnuson of Washington. Applying only to the yellowfin tuna fishery in the eastern tropical Pacific Ocean, the proposed regulations will not interfere with fishing for albacore, bluefin, skipjack, and other tuna. Basically, the regulations provide for:

1. The annual publishing of a yellowfin catch quota, recommended by the Tuna Commission, to be approved by the Secretary of the Interior and the Secretary of State. (For example, the Commission recommended for 1962 a quota of 78,000 short tons for all nations during the open season for yellowfin tuna, and 5,000 tons to be reserved for incidental catches made while fishing for other tuna species after the yellowfin season is closed; the total 1961 catch was 117,300 tons.)

2. An open season from January 1 of each year, terminating on a date (to be determined by the Tuna Commission's Director of Investigations) on which it is deemed the annual catch limit will be reached. This will be based on the aggregate weight of yellowfin tuna landings reported since the opening of the season and the estimated additional quantities expected to be taken by the vessels of all nations in the regulatory area;

3. Permission for vessels to land not more than 15 percent by weight of yellowfin among the other tuna catch on each fishing trip after the yellowfin tuna fishing season is closed;

4. Annual registration and clearance for each fishing trip, in conformity with the regulations, of all vessels wishing to operate in the yellowfin tuna fishery in the regulatory area; and,

5. Provisions for requiring an accurate log of pertinent fishing operations, for reporting by radio once a week during voyages, and for reporting the delivery or sale of a catch of tuna.

Exempted are authorized research fishing vessels, common carrier vessels, those less than 10 gross tons, and those engaged in sport fishing.

These proposed regulations will apply only to persons and vessels subject to the jurisdiction of the United States, and will become operative when all other nations fishing in the regulatory area for species covered under the Convention also comply with the recommendations made by the Tuna Commission in May 1962 for yellowfin tuna conservation. The Government of Costa Rica has invited representatives of all such nations to meet at San Jose, Costa Rica, in November 1962 to set the date when these measures can be put into effect.

Since some of the countries are not parties to the Convention, the conservation objectives depend on international cooperative efforts to implement the Commission's recommendations, Acting Secretary Carr said. To encourage effective cooperation, the regulations also provide for the restriction of all imports of yellowfin tuna taken from the regulatory area from any country which does not comply with conservation measures recommended by the Tuna Commission. In the case of continued abuses, the offending country could be banned from selling in the United States any species of tuna under investigation by the Commission and taken from the regulatory area.

Interested persons were invited to participate in the rule-making process by submitting written data, views, or arguments, to the Area Director, California Area, U.S. Bureau of Commercial Fisheries, 101 Seaside Avenue, Terminal Island, Calif., by November 17, 1962.

A public hearing was held November 19, 1962, at the United Portuguese Club, San Diego 6, Calif., where views were presented orally.

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

I 50 CFR Parts 280, 281

EASTERN PACIFIC TUNA FISHERIES

Yellowfin Tuna; Restrictions on Tuna Imports

Notice is hereby given, pursuant to section 4(a) of the Administrative Procedure Act of June 11, 1946 (60 Stat. 237), and section 6(c) of the Tuna Conventions Act of 1950 (64 Stat. 778), as amended by Public Law 87-814, that the Secretary of the Interior proposes to amend Title 50, Code of Federal Regulations, by adding a new Subchapter H—Eastern Pacific Tuna Fisheries, consisting of Part 280—Yellowfin Tuna and Part 281—Restrictions on Tuna Imports. The proposed regulations are set forth in tentative form below.

The proposed regulations are to be issued under the authority contained in section 6(c) of the Tuna Conventions Act of 1950, as amended by Public Law 87-814. In accordance with the authority cited, after adoption of the regulations proposed as Part 280 and publis-

cation thereof in the **FEDERAL REGISTER**, such regulations are to become applicable to all vessels and persons subject to the jurisdiction of the United States on such date as the Secretary of the Interior shall prescribe, but in no event prior to an agreed date for the application by all countries whose vessels engage in fishing for species of fish covered by the Convention for the Establishment of an Inter-American Tropical Tuna Commission (1 U.S.T. 230), in the regulatory area on a meaningful scale of effective measures for the implementation of the Commission's recommendations applicable to all vessels and persons subject to their respective jurisdictions. Steps are being taken to reach agreement with the several countries whose fishermen participate in the tuna fisheries of the eastern Pacific Ocean concerning a date for the simultaneous application by all such countries of suitable conservation measures to be observed by their fishing vessels.

Prior to the final adoption of the proposed regulations, consideration will be given to any data, views, or arguments pertaining thereto which are submitted in writing to the Area Director, Bureau of Commercial Fisheries, 101 Seaside Avenue, Terminal Island, California, within the period of 30 days from the date of publication of this notice in the **FEDERAL REGISTER**. Interested persons will also be afforded an opportunity to comment orally on the proposed regulations at a public hearing to be held at United Portuguese Club, 2818 Addison Street, San Diego, California, beginning at 9:30 a.m., November 19, 1962. Any person who intends to present views orally at such hearing is requested to furnish in writing his name and the name of the organization he represents, if any, to the said Area Director not later than November 15, 1962.

Issued at Washington, D.C., and dated October 16, 1962.

JAMES K. CARR,
Acting Secretary of the Interior.

PART 280—YELLOWFIN TUNA

Sec.

- 280.1 Definitions.
- 280.2 Basis and purpose.
- 280.3 Catch limit.
- 280.4 Open season.
- 280.5 Closed season.
- 280.6 Registration certificates.
- 280.7 Reports and record keeping.
- 280.8 Persons and vessels exempted.

AUTHORITY: §§ 280.1 to 280.8 issued under sec. 6, 64 Stat. 778, as amended, 16 U.S.C. 955.

§ 280.1 Definitions.

For the purposes of this part, the following terms shall be construed, respectively, to mean and to include:

(a) **Convention.** The Convention for the Establishment of an Inter-American Tropical Tuna Commission, signed at Washington May 31, 1949, by the United States of America and the Republic of Costa Rica (1 U.S.T. 230).

(b) **Commission.** The Inter-American Tropical Tuna Commission established pursuant to the Convention.

(c) **Director of Investigations.** The Director of Investigations, Inter-American Tropical Tuna Commission, La Jolla, California.

(d) **Bureau Director.** The Director of the Bureau of Commercial Fisheries, Fish and Wildlife Service, United States Department of the Interior.

(e) **Area Director.** The Area Director, California Area, Bureau of Commercial Fisheries, Terminal Island, California.

(f) **Regulatory area.** All waters of the eastern Pacific Ocean bounded by the mainland of the Americas and the following lines: Beginning at a point on the mainland where the parallel of 40 degrees north latitude intersects the coast; thence due west to the meridian of 125 degrees west longitude; thence due south to the parallel of 20 degrees north latitude; thence due east to the meridian of 120 degrees west longitude; thence due south to the parallel of 5 degrees north latitude; thence due east to the meridian of 110 degrees west longitude; thence due south to the parallel of 10 degrees south latitude; thence due east to the meridian of 90 degrees west longitude; thence due south to the parallel of 30 degrees south latitude; thence due east to a point on the mainland where the parallel of 30 degrees south latitude intersects the coast.

(g) **Yellowfin tuna.** Any fish of the species *Thunnus albacares* (synonymy: *Neothunnus macropterus*).

(h) **Other tuna fishes.** Those species (and none other) of the family Scombridae which are known as:

(1) Albacore—*Thunnus alalunga* (synonymy: *Thunnus germo*).

(2) Bigeye—*Thunnus obesus* (synonymy: *Thunnus macrurus*).

(3) Bluefin—*Thunnus thynnus* (synonymy: *Thunnus saliens*).

(4) Skipjack—*Katsuwonus pelamis* (synonymy: *Euthynnus pelamis*).

(i) **Fishing vessel.** Every kind, type or description of watercraft subject to the jurisdiction of the United States (other than purse seine skiffs) used in or outfitted for catching or processing fish or transporting fish from fishing grounds.

(j) **Person.** Individual, association, corporation or partnership subject to the jurisdiction of the United States.

(k) **Open season.** The time during which yellowfin tuna may lawfully be captured and taken on board a fishing vessel in the regulatory area without limitation on the quantity permitted to be retained during each fishing trip. Unless otherwise specified, whenever time is stated in hours it shall be construed to refer to standard time in the area affected.

(l) **Closed season.** The time during which yellowfin tuna may not be taken or retained on board a fishing vessel in quantities exceeding the amounts permitted to be taken and retained as an incident to fishing for other tuna fishes.

§ 280.2 Basis and purpose.

(a) At a special meeting held at Long Beach, California on September 14, 1961, the Commission recommended to the parties to the Convention that they take joint action to limit the annual catch of yellowfin tuna from the eastern Pacific Ocean by fishermen of all nations during the calendar year 1962. This recommendation was made pursuant to paragraph 5 of Article II of the Convention on the basis of scientific investigations conducted by the Commission over a period of time dating from 1951. The most re-

cent years of this period were marked by a substantial increase in fishing effort directed toward the yellowfin tuna stocks, resulting in a rate of exploitation of these stocks greater than the maximum average sustainable yield. The Commission's recommendation for joint action by the parties to restrict the yellowfin tuna fishery is as its objective the restoration of these stocks to a level of abundance which will permit maximum average sustainable catch and the maintenance of the stocks in that condition in the future.

(b) At its annual meeting held at Quito, Ecuador, May 16-18, 1962, the Commission affirmed its earlier conclusions regarding the need for regulating the yellowfin tuna fishery in the eastern Pacific Ocean and again recommended to the parties to the Convention that they take joint action to:

(1) Establish a prescribed tonnage limit on the total catch of yellowfin tuna by the fishermen of all nations during the calendar year 1962 from an area of the eastern Pacific Ocean defined by the Commission;

(2) Establish open and closed seasons for yellowfin tuna under prescribed conditions;

(3) Permit the landing of not more than fifteen percent (15%) by weight of yellowfin tuna among the tuna taken on a fishing trip made after the close of the yellowfin tuna fishing season; and

(4) Obtain from governments not parties to the Convention, but having vessels which operate in the fishery, cooperation in effecting the recommended conservation measures.

(c) At a meeting held at _____ on _____ 1962,¹ representatives of the Governments of _____,

_____, and the United States of America (being the several countries which are parties to the Convention or, not being parties, exercised jurisdiction over vessels which, during 1962, engaged in fishing for species covered by the Convention in the regulatory area on a meaningful scale), gave assurances that beginning as of _____, each country would apply to all vessels and persons subject to its jurisdiction effective measures for the implementation of the recommendations made by the Commission in May 1962 for a yellowfin tuna conservation regime.

(d) The regulations in this part are designed to implement the Commission's current and future recommendations for the conservation of yellowfin tuna so far as they affect all vessels and persons subject to the jurisdiction of the United States.

§ 280.3 Catch limit.

The annual limitation on the quantity of yellowfin tuna permitted to be taken from the regulatory area during the open season by the fishing vessels of all nations participating in the fishery will be fixed and determined on the basis of recommendations made by the Commission pursuant to paragraph 5 of Article II of the Convention. Upon approval by the Secretary of State and the Secretary of the Interior of the recommended catch limit, announcement of the catch limit

¹ Arrangements are being made to hold a meeting of the Governments concerned early in November 1962.

thus established shall be made by the Bureau Director through publication of a suitable notice in the *FEDERAL REGISTER*. The Bureau Director, in like manner, shall announce any revision or modification of an approved annual catch limit which may subsequently enter into force.

§ 280.4 Open season.

The open season for yellowfin tuna fishing shall begin annually at 12:01 a.m. of the first day of January and terminate at midnight on a date to be determined and announced as provided in § 280.5.

§ 280.5 Closed season.

(a) Pursuant to authority granted by the Commission, the Director of Investigations will maintain records of the catches of yellowfin tuna taken from the regulatory area and landed from time to time during the open season by the fishing vessels of all nations participating in the fishery. By taking into account the aggregate weight of the yellowfin tuna landings and the estimated additional quantities of yellowfin tuna expected to be taken by the fishing vessels of all nations operating in the regulatory area, the Director of Investigations will determine the date on which he deems the annual catch limit will be reached and will promptly notify the Bureau Director of such date. The Bureau Director shall announce the season closure date thus established by publication in the *FEDERAL REGISTER*. The closure date so announced shall be final except that if it shall at any time become evident to the Director of Investigations that the catch limit will not be reached by such date, he may substitute another date which shall be announced by the Bureau Director in like manner as provided for the date originally determined.

(b) After the date determined in the manner provided in this section for the closing of the yellowfin fishing season, the taking of yellowfin tuna shall be prohibited until the yellowfin tuna fishing season reopens on January 1 next following the close of the season: *Provided*, That any fishing vessel which has departed port to engage in yellowfin tuna fishing prior to the date of the closure of the yellowfin fishing season may continue to take and retain yellowfin tuna without restriction as to quantity until the fishing voyage has been completed by unloading the whole or any part of the fishing vessel's cargo of tuna in port: *Provided further*, That after the close of the yellowfin tuna fishing season as provided in this section, yellowfin tuna captured as an incident to fishing for other tuna fishes may be taken on board a fishing vessel and landed in an amount not exceeding fifteen percent by weight of all tuna fishes on board the vessel from which the fishing was conducted.

§ 280.6 Registration certificates.

(a) Except as permitted by § 280.8, after the _____ day of _____, 1962, no person shall use a fishing vessel for the capture, retention, transportation, or landing of yellowfin tuna in any quantity from the regulatory area unless such vessel shall have first been registered and cleared for yellowfin tuna fishing in conformity with the provisions of this section.

(b) The managing owner, master, or other person in charge of a fishing ves-

sel may register such vessel to engage in yellowfin tuna fishing by furnishing, either by letter or on a form to be supplied by the Bureau of Commercial Fisheries, information specifying the names and addresses of the managing owner and master, respectively, of the vessel, and the name, official number, home port, and cargo capacity (in tons of frozen tuna) of the vessel. Such application shall be submitted to the Area Director who shall, without charge, issue in the name of the fishing vessel a certificate evidencing its registration to engage in yellowfin tuna fishing during the calendar year applied for. Each such certificate shall expire at the end of the calendar year during which it is issued and shall be replaced by a new certificate upon application made in like manner as prescribed for the original certificate. New certificates shall similarly be issued to replace lost or mutilated certificates.

(c) Not earlier than 48 hours prior to each departure from port to engage in tuna fishing during the open season for yellowfin tuna, the master or other person in charge of a fishing vessel shall present the vessel's registration certificate for validation. Validation of a registration certificate shall be accomplished in the manner specified in paragraph (e) of this section. Such validation shall terminate at the time of the first landing thereafter of any part of the catch of tuna taken during the voyage authorized by the validated certificate.

(d) Prior to each departure from port during the closed season to engage in fishing for species of tuna other than yellowfin, the master or other person in charge of a fishing vessel shall present the vessel's registration certificate for validation for the purpose of permitting the retention on board such vessel of yellowfin tuna, taken as an incident to fishing for other tuna species, in an amount not exceeding fifteen percent by weight of all tuna species taken by the fishing vessel during the voyage covered by the validated certificate. Validation of a registration certificate during the closed season shall likewise be accomplished in the manner prescribed in paragraph (e) of this section and such validation shall terminate at the time of the first landing thereafter of any part of the catch of tuna taken during the voyage covered by the validated certificate.

(e) Validation of a registration certificate as required in paragraphs (c) and (d) of this section shall, upon proper request, be entered as an endorsement made by an authorized validating officer upon the certificate held by the fishing vessel. Authorized officers, as listed below, and their authorized representatives, may perform the functions of authorized validating officers:

(1) For fishing vessels departing ports of the United States—

Area Director, California Area, Bureau of Commercial Fisheries, Terminal Island, California; and Regional Director, Pacific Region, Bureau of Commercial Fisheries, Areade Building, Seattle, Washington.
Officers of the United States Bureau of Customs.

Officers of the United States Coast Guard.
Officers and employees of the Commonwealth of Puerto Rico.

(2) For fishing vessels departing foreign ports—

The officer in charge at each of the following United States Consular posts:
Colombia: Barranquilla, Bogota, Buenaventura, and Cali.
Chile: Antofagasta, Concepcion, Santiago, and Valparaiso.
Costa Rica: Puntarenas and San Jose.
Ecuador: Guayaquil and Quito.
El Salvador: San Salvador.
Guatemala: Guatemala.
Mexico: Mexico, D.F., and Mazatlan.
Nicaragua: Managua.
Panama: Colon and Panama.
Peru: Arequipa and Lima.

(f) As circumstances require, the Bureau Director from time to time shall revise the list of authorized validating officers by publishing appropriate changes in the *FEDERAL REGISTER*. In the event an authorized validating officer is not available in port at the time of impending departure of a fishing vessel on a fishing voyage, a validation of the nature required by paragraph (c) or (d) of this section may be obtained by letter or telegraphic communication.

(g) The registration certificate and validation endorsements thereon issued as provided in this section shall at all times be carried on board the fishing vessel for which issued and such certificate, the vessel, and its cargo shall at all times be subject to inspection for the purposes of this part by officers authorized to enforce the provisions of this part.

§ 280.7 Reports and record keeping.

The master or other person in charge of a fishing vessel holding a registration certificate issued under this part shall—

(a) Keep an accurate log of all fishing operations conducted from the vessel, entering therein for each day the name and official number of the vessel, date, noon position (stated in latitude and longitude or in relation to known physical features) and the estimated quantities (in short tons) of tuna fish by species which are taken on board the vessel: *Provided*, That the fishing record and bridge log maintained at the request of the Commission shall be deemed a sufficient compliance with this paragraph whenever the items of information specified herein are fully and accurately entered in such log;

(b) Report by radio at least once each calendar week during a fishing voyage (alternatively) to Radio Station WWB, La Jolla, California, 415.8 mc or 3805.6 kc, to Radio Station Balboa, Canal Zone (call letters and frequencies to be supplied later), or by prepaid commercial radio message directed to the Director of Investigations. Radio reports shall be made between the hours of 8:00 a.m. and 12:00 midnight and shall state the name of the fishing vessel and the cumulative estimated quantities, by species, of all tuna fish taken on board during the fishing voyage from the time of departure from port until the return of the vessel to port; and

(c) Furnish on a form supplied by the Bureau of Commercial Fisheries, immediately following the delivery or sale of a catch of tuna made by means of such vessel, a report, certified to be correct, giving the name and official number of the fishing vessel, the dates of commencement and conclusion of the fishing trip and listing separately by species and weight in short tons, the gross quantities

of each species of tuna fish so sold or delivered: *Provided*, That, at the option of the vessel master or other person in charge, a copy of the fish ticket, weigh-out slip, settlement sheet, or similar record customarily issued by the fish dealer or his agent may be used for reporting purposes, in lieu of the form supplied by the Bureau of Commercial Fisheries, if such alternate record is similarly certified and contains all items of information required by this subparagraph. Such report shall be delivered or mailed to the Area Director within 24 hours after the weigh-out has been completed.

§ 280.8 Persons and vessels exempted.

Nothing contained in §§ 280.2 to 280.7 shall apply to:

(a) Any person or vessel authorized by the Commission, the Bureau Director, or any State of the United States to engage in fishing for research purposes.

(b) Any vessel documented as a common carrier by the Government of the United States and engaged exclusively in the carriage of freight and passengers.

(c) Any vessel of less than ten gross tons.

(d) Any person or vessel engaged in sport fishing for personal use.

PART 281—RESTRICTIONS ON TUNA IMPORTS

Sec.

281.1 Definitions.

281.2 Basis and purpose.

281.3 Species subject to regulation.

281.4 Special investigation by the Commission.

281.5 Investigations authorized.

281.6 Publication of findings.

281.7 Proof of admissibility.

281.8 Removal of import restrictions.

AUTHORITY: §§ 281.1 to 281.8 issued under sec. 6, 64 Stat. 776, as amended, 16 U.S.C. 955.

§ 281.1 Definitions.

For the purposes of this part, the following terms shall be construed, respectively, to mean and to include:

(a) *United States*. All areas under the sovereignty of the United States, the Trust Territory of the Pacific Islands, and the Canal Zone.

(b) *Convention*. The Convention for the Establishment of an Inter-American Tropical Tuna Commission, signed at Washington, May 31, 1949, by the United States of America and the Republic of Costa Rica (1 U.S.T. 230).

(c) *Commission*. The Inter-American Tropical Tuna Commission established pursuant to the Convention.

(d) *Bureau Director*. The Director of the Bureau of Commercial Fisheries, Fish and Wildlife Service, United States Department of the Interior.

(e) *Regulatory area*. All waters of the eastern Pacific Ocean bounded by the mainland of the Americas and the following lines: Beginning at a point on the mainland where the parallel of 40 degrees north latitude intersects the coast; thence due west to the meridian of 125 degrees west longitude; thence due south to the parallel of 20 degrees north latitude; thence due east to the meridian of 120 degrees west longitude; thence due south to the parallel of 5 degrees north latitude; thence due east to the meridian of 110 degrees west longitude; thence due south to the parallel of

10 degrees south latitude; thence due east to the meridian of 90 degrees west longitude; thence due south to the parallel of 30 degrees south latitude; thence due east to a point on the mainland where the parallel of 30 degrees south latitude intersects the coast.

(f) *Yellowfin tuna*. Any fish of the species *Thunnus albacares* (synonym: *Neothunnus macropterus*).

(g) *Other tuna fishes*. Those species (and none other) of the family Scombridae which are known as:

(1) Albacore—*Thunnus alalunga* (synonym: *Thunnus germo*).

(2) Bigeye—*Thunnus obesus* (synonym: *Parathunnus sibi*).

(3) Bluefin—*Thunnus thynnus* (synonym: *Thunnus saliens*).

(4) Skipjack—*Katsuwonus pelamis* (synonym: *Kuthynnus pelamis*).

(h) *Fishing vessel*. Every kind, type or description of watercraft (other than purse seine skiffs) used in or outfitted for catching or processing fish or transporting fish from fishing grounds.

(i) *Person*. Individual, association, corporation or partnership.

§ 281.2 Basis and purpose.

(a) At a special meeting held at Long Beach, California on September 14, 1961, the Commission recommended to the Government of Costa Rica, Ecuador, Panama, and the United States of America, parties to the Convention, that they take joint action to limit the annual catch of yellowfin tuna from the eastern Pacific Ocean by fisherman of all nations during the calendar year 1962. This recommendation was made pursuant to paragraph 5 of Article II of the Convention on the basis of scientific investigations conducted by the Commission over a period of time dating from 1951. The most recent years of this period were marked by a substantial increase in fishing effort directed toward the yellowfin tuna stocks, resulting in a rate of exploitation of these stocks greater than that at which the maximum average sustainable yield may be obtained. The Commission's recommendation for joint action by the parties to regulate the yellowfin tuna fishery has as its objective the restoration of these stocks to a level of abundance which will permit maximum average sustainable catch and the maintenance of the stocks in that condition in the future.

(b) At its annual meeting held at Quito, Ecuador, May 16–18, 1962, the Commission affirmed its earlier conclusions regarding the need for regulating the yellowfin tuna fishery in the eastern Pacific Ocean and again recommended to the parties to the Convention that they take joint action to:

(1) Establish a prescribed tonnage limit on the total catch of yellowfin tuna by the fishermen of all nations during the calendar year 1962 from an area of the eastern Pacific Ocean defined by the Commission;

(2) Establish open and closed seasons for yellowfin tuna under prescribed conditions;

(3) Permit the landing of not more than fifteen percent (15%) by weight of yellowfin tuna among the tuna taken on a fishing trip made after the close of the yellowfin tuna fishing season; and

(4) Obtain from governments not parties to the Convention, but having

vessels which operate in the fishery, co-operation in effecting the recommended conservation measures.

(c) At a meeting held at _____ on _____ 1962, representatives of the Governments of _____,

_____, and the United States of America (being the several countries which are parties to the Convention or, not being parties, exercised jurisdiction over vessels which, during 1962, engaged in fishing for species covered by the Convention in the regulatory area on a meaningful scale), gave assurances that beginning as of _____, each country would apply to all vessels and persons subject to its jurisdiction effective measures for the implementation of the recommendations made by the Commission in May 1962 for a yellowfin tuna conservation regime.

(d) In conformity with the provisions of section 6(c) of the Tuna Conventions Act of 1950, as amended, and simultaneously with the adoption of the regulations in this part, the Secretary of the Interior has made effective Part 280 of this title for the purpose of carrying out the current and future recommendations of the Commission for the conservation of yellowfin tuna in the regulatory area so far as such recommendations affect all vessels and persons subject to the jurisdiction of the United States.

(e) The yellowfin tuna stocks recommended for regulation by the Commission constitute a significant part of an international high seas fishery in which the vessels of a number of countries are engaged in varying degrees. Since some of the countries are not parties to the Convention and, therefore, have no applicable treaty obligations to fulfill, the achievement of the conservation objectives with respect to the tuna resources of the eastern Pacific Ocean is dependent upon international cooperative efforts to implement the Commission's recommendations. With a view toward encouraging effective cooperation on the part of such countries, the Tuna Conventions Act of 1950, as amended, directs that restrictions be established on the importation of certain tuna fish from any country which shall fail to take action to prevent the occurrence of certain proscribed activities. Thus, section 6(c) of the Act provides that the Secretary of the Interior, with the concurrence of the Secretary of State, shall promulgate regulations—

(1) To prohibit the entry into the United States from any country when the vessels of such country are being used in the conduct of fishing operations in the regulatory area in such manner or in such circumstances as would tend to diminish the effectiveness of the conservation recommendations of the Commission, of fish in any form of those species which are subject to regulation pursuant to a recommendation of the Commission and which were taken from the regulatory area; and

(2) To prohibit entry into the United States, from any country, of fish in any form of those species which are subject to regulation pursuant to a recommendation of the Commission and which were taken from the regulatory area by vessels other than those of such country in such manner or in such circumstances as would tend to diminish the effectiveness of the conservation recommendations of the Commission.

¹ Arrangements are being made to hold a meeting of the Governments concerned early in November 1962.

(f) Section 6(c) of the Act further provides that "in the case of repeated and flagrant fishing operations in the regulatory area by the vessels of any country which seriously threaten the achievement of the objectives of the Commission's recommendations, the Secretary of the Interior, with the concurrence of the Secretary of State, may, in his discretion, also prohibit the entry from such country of such other species of tuna, in any form, as may be under investigation by the Commission and which were taken in the regulatory area."

(g) The regulations in this part are designed to implement the provisions of section 6(c) of the Act with respect to import controls and to prescribe procedures for the establishment of restrictions on imports of tuna whenever such action shall be deemed warranted.

§ 281.3 Species subject to regulation.

The species of fish currently subject to regulation pursuant to a recommendation of the Commission within the meaning of section 6(c) of the Act is yellowfin tuna.

§ 281.4 Species under investigation by the Commission.

The species of fish currently under investigation by the Commission within the meaning of section 6(c) of the Act are yellowfin tuna, skipjack tuna, and bigeye tuna.

§ 281.5 Investigations authorized.

(a) The Bureau Director shall cause to be made from time to time such inquiries and investigations as may be necessary to keep himself and other persons concerned currently informed regarding the nature and effectiveness of the measures for the implementation of the Commission's recommendations which are being carried out by countries whose vessels engage in fishing within the regulatory area. In making a finding as to whether or not a country is condoning the use of vessels in the conduct of fishing operations in the regulatory area in such manner or in such circumstances as would tend to diminish the effectiveness of the conservation recommendations of the Commission, the Bureau Director shall take into account, among such other considerations as may appear to be pertinent in a particular case, the following factors:

(1) Whether or not the country provides or causes to be provided to the Commission pertinent statistics on a timely basis.

(2) Whether or not the country has in force conservation measures applicable to its own fishermen adequate for the implementation of the Commission's recommendations.

(3) Whether or not the country has in force measures for the control of landings in its ports of species subject to regulation which are taken in the regulatory area by fishermen of other countries contrary to the Commission's conservation recommendations.

(4) Whether or not the country, having put conservation measures into effect, takes reasonable action to enforce such measures.

(5) The number of vessels of the country which conduct fishing operations in the regulatory area.

(6) The quantity of species subject to regulation taken from the regulatory area by the country's vessels contrary

to the Commission's conservation recommendations and its relationship to (i) the total quantity permitted to be taken by the vessels of all countries participating in the fishery and (ii) the quantity of such species sought to be restored to the stocks of fish pursuant to the Commission's conservation recommendations.

(b) Any person who shall have reason to believe that the vessels of any country are being used in the conduct of fishing operations in the regulatory area in such manner or in such circumstances as would tend to diminish the effectiveness of the conservation recommendations of the Commission or that other acts within the purview of the import control provisions of section 6(c) of the Tuna Conventions Act of 1950, as amended, are occurring or are likely to occur, may communicate his belief to the Bureau Director. Every such communication shall contain or be accompanied by a full statement of the reasons for the belief, including a detailed description of such specific acts or events as may support the belief, and such other pertinent facts as may indicate a need for instituting an investigation as authorized in this part.

(c) Upon receipt by the Bureau Director of any communication submitted pursuant to paragraph (b) of this section and found to comply with the requirements of that paragraph, the Bureau Director promptly shall cause such investigation to be made as appears to be warranted by the circumstances of the case. In conducting such investigation the Bureau Director or his designated representative shall consider any representations offered by foreign interests, importers, brokers, domestic producers, or other interested persons. Unless good cause to the contrary shall exist, every such investigation shall be completed within 60 days following receipt of the communication.

§ 281.6 Publication of findings.

If it shall be determined on the basis of § 281.5 that species of fish subject to regulation or under investigation by the Commission, as the case may be, are ineligible for entry into the United States from a particular country pursuant to the provisions of section 6(c) of the Act, the Bureau Director, with the approval of the Secretary of the Interior, shall publish a finding to that effect in the **FEDERAL REGISTER**. Effective upon the date of publication of such finding in the **FEDERAL REGISTER** every shipment of fish in any form of the species under regulation or under investigation by the Commission offered for entry either directly or indirectly from the country named in the finding shall be denied entry unless it shall be established by satisfactory proof pursuant to § 281.7 that a particular shipment of such fish is not ineligible for entry: *Provided*, That entry shall not be denied and no such proof shall be required for any such shipment which, on the date of such publication, was in transit to the United States on board a vessel operating as a common carrier.

§ 281.7 Proof of admissibility.

For the purposes of § 281.6 and section 8(e) of the Tuna Conventions Act of 1950, as amended, a shipment of fish in any form of the species under regulation or under investigation by the Com-

mission offered for entry, directly or indirectly, from a country named in a finding published under such § 281.6 shall be deemed to be eligible for entry if the shipment is accompanied by a certificate of eligibility, executed in the form and manner set forth below, certifying that the tuna in the shipment are not of the species specified in the published finding or, if of such species, were not taken in the regulatory area. The required certificate of eligibility must be executed by a duly authorized official of the country named in the published finding and the certificate must be authenticated with respect to the signature and official position of the person executing the same by a consular officer or consular agent of the United States.

CERTIFICATE OF ELIGIBILITY

I, _____, an authorized officer of the Government of _____, certify that the shipment of tuna fish accompanied by this certificate, consisting of _____ (Quantity)

in _____ (Species) (Number and kind of packages or containers) bearing the following marks _____

□ (a) Contains no fish of the species prohibited entry into the United States by virtue of a finding of ineligibility published under regulations issued pursuant to section 6(c) of the Tuna Conventions Act of 1950, as amended.

□ (b) Contains fish of the species prohibited entry into the United States by virtue of a finding of ineligibility published under regulations issued pursuant to section 6(c) of the Tuna Conventions Act of 1950, as amended, but that such fish were caught in the waters of _____ (Identify area or areas in which fish were taken) by vessels subject to the jurisdiction of _____ (Country)

and that none of the said fish was taken in any part of the eastern Pacific Ocean subject to conservation regulations pursuant to recommendations of the Inter-American Tropical Tuna Commission.

(Signature)

(Title)

(Address)
[This certificate must be accompanied by a certificate of authentication executed by a consular officer or consular agent of the United States]

§ 281.8 Removal of import restrictions.

Upon a determination by the Bureau Director that the conditions no longer exist which warranted the imposition of import restrictions against the country named in the finding published pursuant to section 281.6, the Bureau Director, with the approval of the Secretary of the Interior, shall publish a finding to such effect in the **FEDERAL REGISTER**. Effective upon the date of publication of such finding, the prior existing import restrictions against the country designated therein shall terminate: *Provided*, That for a period of one year from such date of publication every shipment of fish in any form of the species subject to regulation or under investigation by the Commission shall continue to be denied entry unless the shipment is accompanied by a certification executed by an authorized official of the country of export and authenticated by a consular officer or consular agent of

the United States, certifying that no portion of the shipment is comprised of fish which are of species under regulation and which were prohibited from entry under the prior existing import restrictions.



Department of the Treasury

COAST GUARD

PLANS FOR FULL-TIME FISHERIES PATROL VESSEL FOR GEORGES BANK:

Plans for a full-time Coast Guard patrol vessel for the Georges Bank fishing grounds off the New England coast were made public in a letter from the Department of State to Senator Saltonstall. Provision for the fisheries patrol vessel is included in the Coast Guard's 1964 fiscal year plans.

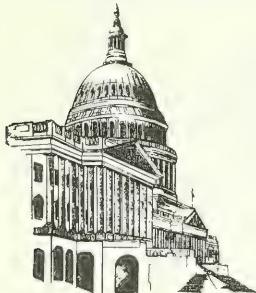
At present Coast Guard search and rescue patrols off the New England coast are being used for fisheries patrols when they are not engaged in their primary mission.



Eighty-Seventh Congress

(Second Session)

CONGRESS ADJOURNS: The Eighty-Seventh Congress adjourned "sine die" or finally on Oct. 13, 1962, and a number of bills of interest to fisheries ended up as "unfinished business." These bills will have to be re-introduced in the 88th Congress next year if they are to receive consideration, since all bills not completed during the Second Session of this Congress are "dead" and do not carry over to the Eighty-Eighth Congress, which will convene in January 1963. Also, this means that bills if and when re-introduced must go through the entire process of committee consideration, hearings, etc. Before adjourning, the House and the Senate on October 13



adopted H. J. Res. 907, fixing the time of assembly of the 88th Congress as January 9, 1963. Ordinarily the next Congress would have convened on January 3, 1963.

AMERICAN SAMOA INCLUDED IN CERTAIN LAWS: Public Law 87-688, 87th Congress (H. R. 10062), Sept. 25, 1962, an act to extend the application of certain laws to American Samoa. Authorizes the Secretary of the Interior to request Federal departments, corporations, or agencies to extend, without reimbursement, scientific and technical assistance to promote the welfare of the territory. Examples of the sorts of technical assistance which may be called for from time to time include revision of Samoa's tax structure, education, agricultural and fisheries production and marketing, harbor improvement, public utilities, and land planning and zoning. There is a limitation of an aggregate of \$150,000 in any one fiscal year.

FISHERY MARKETING ACT AMENDMENT: Senator Warren G. Magnuson (D.-Wash.), Chairman of the Senate Committee on Commerce, announced on Oct. 3 that the Merchant Marine and Fisheries Subcommittee will hold public hearings in mid-October in Seattle and in four Alaska communities on S. 3093, sponsored by him and Senator E. L. (Bob) Bartlett of Alaska. Senator Bartlett will chair the hearings.

The measure, introduced as part of the Senate Commerce Committee's study on the subject, would amend the Fisheries Marketing Act of 1934, an act originally designed to provide fishermen as primary producers with the right of self-association for cooperative improvements of their conditions. The amendment seeks to bring the Marketing Act up to date by relating it to the practical problems that presently cloud the rights of fishermen to associate themselves together, whether in unions or cooperatives, and collectively bargain for a fair return on the fish harvested by their labors at sea.

S. 3093 would make clear that fishermen's organizations, regardless of their technical legal status, have a voice in the ex-vessel sale of fish or other aquatic products on which the livelihood of their members depends.

In introducing the measure last April, Senator Magnuson said he did so to give the industry a chance to study the proposal. "What is needed," he said, "above all is to bring together in a comprehensive record the facts pertinent to the problems we are striving to solve with this legislation. To guide us we need the ideas and mature judgments of the producers, the dealers, the canners, and all others who make up the U. S. fishery. Out of such an approach, I am sure, will emerge a solution that will help us to legislate a foundation for stable relationships between the several divisions of our industry."

Senator Bartlett held the first hearing in Seattle, Wash., on October 15. This was followed by hearings in Ketchikan on October 16, Petersburg on October 17, Anchorage on October 18, and Dillingham, Alaska, on October 19. It is expected that November hearings will be held in San Pedro, Calif., Senator Magnuson said.

FISHERY PROBLEMS: The appendix of the Congressional Record of Oct. 9, 1962 (pp. A7483-84) reported on the extension of remarks by Congressman Kirwan, who inserted an article by Senator Benjamin

Smith of Massachusetts, "Our Fishing Fleet Comes in Fifth--Using New Techniques of Catching and Processing, Other Nations Have Far Surpassed Us in This Vital Field--A Senator Outlines What Can Be Done About It." Senator Smith in his article points out that the United States fishing fleet comes in fifth among the world's fishing fleets. He also points out that the efficiency of foreign fishing fleets, such as Japanese and Soviet, have increased in recent years. That as late as 1948 the United States supplied nearly 13 percent of the world's fishery production. Now we are down to 7.4 percent. The Senator proposes expanding research in finding, catching, and processing fish; additional research vessels for the U. S. Bureau of Commercial Fisheries; Government matching grant or loan program to help the fishing industry in key areas; a matching fund program to help the State commercial fishery agencies; a loan program to help the processors; Government and industry cooperation in developing new products and marketing techniques. Senator Smith also states, ". . . We have a great opportunity in the fishing field. We can begin today to rehabilitate our fishermen and regain our rightful place among the nations of the world. The benefits to our economy and our foreign policy will greatly exceed the costs. I hope that both the Government and industry will see the truth in this and make the effort necessary to save the American fishing industry."

FISH PROTEIN CONCENTRATE: Fish Protein Concentrate (Hearings before a Subcommittee of the Committee on Interstate and Foreign Commerce, House of Representatives, 87th Congress, 2nd Session), 133 pp., printed. Contains hearings held on Aug. 8 & 9, 1962, on H. R. 9101, H. R. 9102, H. R. 9331, H. R. 10587, to amend clause (3) of section 402 (a) of the Federal Food, Drug, and Cosmetic Act. Bills would amend chapter 4--Food--section 402 (Adulterated Food) of the Federal Food, Drug, and Cosmetic Act as amended which spells out what makes the food adulterated. It would provide that processed seafood products can be produced from whole fish. Clause (3) of section 402 (a) of the Federal Food, Drug, and Cosmetic Act is amended by inserting: ". . . but no processed seafood product shall be deemed to consist of any such substance or to be otherwise unfit for food because such processed seafood product is derived from whole fish, provided such product is processed under sanitary conditions and after processing is nutritious and in no manner harmful to the health of consumers thereof." Also contains the reports of various Government agencies, testimony given by Congressmen, industry, and Government agencies, and additional information and communications submitted to the Committee.

FISHERY RESOURCES INTERNATIONAL CONFERENCE: S. Rept. 2112, International Fisheries Conference (Sept. 20, 1962), a report from the Committee on Commerce, U. S. Senate, 87th Congress, 2nd Session to accompany S. Res. 392, 7 pp., printed. Resolution is to express the sense of the Senate on an International Conference on the Conservation of Fishery Resources. The Committee reported favorably and recommended that the resolution be adopted. The resolution is of great significance and importance because of an amendment to the Trade Expansion Act of 1962 (H. R. 11970). The text of the amendment is as follows: "Upon the convocation of a conference on the use or conservation of international fishery resources, the President shall, by all appropriate means at his disposal, seek to persuade countries whose domestic fishing practices or policies affect such resources, to engage in negotiations

in good faith relating to the use or conservation of such resources. If, after such efforts by the President and other countries which have agreed to engage in such negotiations, any other country whose conservation practices or policies affect the interests of the United States and such other countries has in the judgment of the President, failed or refused to engage in such negotiations in good faith, the President may, if he is satisfied that such action is likely to be effective in inducing such country to engage in such negotiations in good faith, increase the rate of duty on any fish in any form imported from such country into the United States for such time as he deems necessary, to a rate not more than 50 per centum above the rate existing on July 1, 1934." S. Res. 392, briefly summarizes the reasons why it is important that an international conference be held to consider conservation of fishery resources. The resolution states:

"Whereas the increasing world population and the consequent growing demand for animal protein, together with industrial and economic development in all parts of the world, have resulted in remarkable expansion of world fishing effort; and

"Whereas technological developments have vastly improved man's ability to harvest the living resources of the sea; and

"Whereas estuarine fishery resources, to which little attention has been devoted on a worldwide basis in spite of their increasing importance as a source of human food, present unique scientific and technical problems; and

"Whereas these developments raise new technical and scientific conservation problems the solution of which would best be approached on a worldwide basis; Now, therefore, be it

"Resolved, That it is the sense of the Senate that the President should propose an International Conference on the Conservation of Fishery Resources to consider the technical, economic, and scientific problems relating to the conservation, utilization, and regulation of living marine resources in the high seas and estuarine waters of the world, and that government, industrial, scientific, and technical participation in such Conference on as wide a basis as may be practicable should be encouraged." The report also contains a short explanation of the world food problem and the United States fishing industry.

The Senate on Sept. 20, 1962, adopted S. Res. 392. Since this is a Senate resolution no House action is required.

FOOD AND AGRICULTURE ACT OF 1962: H. Rept. 2385, Food and Agriculture Act of 1962 (Sept. 17, 1962, Conference Report from the Committee of Conference, House of Representatives, 87th Congress, 2nd Session to accompany H. R. 12391, 37 pp., printed. To improve and protect farm income, to reduce costs of farm programs to the Federal Government, to reduce the Federal Government's excessive stocks of agricultural commodities, to maintain reasonable and stable prices of agricultural commodities and products to consumers, to provide adequate supplies of agricultural commodities for domestic and foreign needs, to conserve natural resources, and for other purposes. The Committee of Conference recommended passage to their respective Houses. The Committee retained the amendment to Sec. 343 which is as follows: "As

used in this title (1) the term 'farmers' shall be deemed to include persons who are engaged in, or who, with assistance afforded under this title, intend to engage in fish farming, and (2) the term 'farming' shall be deemed to include fish farming." Contains various other amendments agreed to and the statement of Managers on the part of the House.

INDEPENDENT OFFICE APPROPRIATIONS: Independent Offices Appropriations, 1963 (Hearings before the Subcommittee of the Committee on Appropriations, U. S. Senate, 87th Congress, 2nd Session, on H. R. 12711 making appropriations for sundry independent executive bureaus, boards, commissions, corporations, agencies, and offices, for the fiscal year ending June 30, 1963, and for other purposes), 1,459 pp., printed. Contains hearing held on Aug. 6, 1962; includes, among others, testimony given on behalf of the Office of Science and Technology; National Science Foundation and various agencies. Under the National Science Foundation mention was made of oceanographic research, its vessels and facilities.

The President on Oct. 3, 1962, signed H. R. 12711 (P. L. 87-741), making appropriations for sundry independent executive bureaus, boards, commissions, corporations, agencies, and offices for the fiscal year ending June 30, 1963, and for other purposes. Included are funds for the Office of Science and Technology, (\$750,000).

MAINE LOBSTERMAN STATUE: H. Rept. 2445, Making Provisions for a Statute to "The Maine Lobsterman" in the "New Southwest," Washington (Sept. 20, 1962, a report from the Committee on the District of Columbia, House of Representatives, 87th Congress, 2nd Session, to accompany H. Res. 799), 1 p., printed. The Committee reported favorably and recommended passage. Contains the purpose of the resolution.

MEDICAL CARE FOR VESSEL PERSONNEL AND OWNERS: Medical Care for Fishing Boat Owners (Hearing before a Subcommittee of the Committee on Interstate and Foreign Commerce, House of Representatives, 87th Congress, 2nd Session), 50 pp., printed. Contains hearings held on Aug. 13, 1962, on H. R. 2262, to amend section 322 of the Public Health Service Act to permit certain owners of fishing boats to receive medical care and hospitalization without charge at hospitals of the Public Health Service; H. R. 3797, H. R. 8029, H. R. 10921, H. R. 11920, to provide medical care for certain persons engaged on board a vessel in the care, preservation, or navigation of such vessel; and S. 367, to provide medical care for certain persons engaged on board a vessel in the care, preservation, or navigation of such vessel. Also contains, the reports of various Federal agencies, statements submitted by industry people and Government agencies and communications submitted to the Committee.

NATIONAL FISHERIES CENTER AND AQUARIUM: The House Committee on Rules, Oct. 1, 1962, granted a rule to take H. R. 8181 (to authorize the construction of a National Fisheries Center and Aquarium in D. C., and to provide for its operation) from the Speaker's table to consider Senate amendments thereto. Sen. Delaney for the Committee on Rules, filed a privileged resolution (H. Res. 822, Rept. No. 2503) which was referred to the House Calendar.

The House on Oct. 2, 1962, adopted H. Res. 822, providing for House agreement to Senate amendments to

H. R. 8181. This action cleared the legislation for Presidential action. The Senate passed the bill on Sept. 21, 1962.

The President on Oct. 9, 1962, signed H. R. 8181 (P. L. 87-758).

The Speaker of the House on Oct. 13, 1962, appointed Congressmen Kirwan and Jensen to membership on the National Fisheries Center and Aquarium Advisory Board.

NETTING IMPORTS FOR RESEARCH: The Senate Sept. 28, 1962, adopted the conference report (H. Rept. 2413) on H. R. 12180, to extend for a temporary period the existing provisions of law relating to the free importation of personal and household effects brought into the United States under Government orders. The bill as adopted includes an amendment (the text of S. 1814) providing for free importation of monofilament gill nets for use in fish sampling.

The President on Oct. 10, 1962, signed H. R. 12180 (P. L. 87-790).

OCEANOGRAPHIC RESEARCH PROGRAM: The House on Oct. 1, 1962, adopted the conference report (H. Rept. 2493) on S. 901, to advance the marine sciences, to establish a comprehensive 10-year program of oceanographic research and surveys, to promote commerce and navigation, to secure the national defense, to expand ocean, coastal, and Great Lakes resources, to authorize the construction of research and survey ships and laboratory facilities, to expedite oceanographic instrumentation, to assure systematic studies of effects of radioactive materials in marine environments, to enhance the public health and general welfare, and for other purposes. Sent to the Senate for approval of conference report.

OCEANOGRAPHIC RESEARCH PROGRAM: H. Rept. 2493, Oceanographic Act of 1962 (Sept. 27, 1962, conference report of the Committee of Conference, House of Representatives, 87th Congress, 2nd Session, to accompany S. 901), 6 pp., printed. To advance the marine sciences, to establish a comprehensive 10-year program of oceanographic research and surveys, to promote commerce and navigation, to secure the national defense, to expand ocean, coastal, and Great Lakes resources, to authorize the construction of research and survey ships and laboratory facilities, to expedite oceanographic instrumentation, to assure systematic studies of effects of radioactive materials in marine environments, to enhance the public health and general welfare, and for other purposes. The Committee recommended to their respective Houses that the bill as reported in the report be adopted. Contains the amendment, and statement of the managers on the part of the House.

The Senate on Oct. 3, 1962, adopted the conference report (H. Rept. 2493) on S. 901. It is to be cited as the "Oceanographic Act of 1962." This action cleared the bill for the President's signature. The bill as agreed to by the conferees contains no authorization for funds, for construction of ships, for purchase of instruments, or for research. It just declares as a policy of the United States to develop, encourage, and maintain a long-range national program in oceanography, to be participated in by all qualified persons, organizations, institutions, agencies or entities. To make such a policy work, the Office of Science and Technology is directed to advance or develop a national program of oceanography, to issue a statement of national goals, methods of achieving them, and how the various agencies of Government will fit in to the over-all plan.

On Oct. 17, 1962, the 10-day period for Presidential action on S. 901 expired. The failure of the President to sign this legislation within the 10 days after Congress adjourned constitutes a pocket veto.

OYSTER PLANTERS DISASTER LOANS: Emergency Loans to Oyster Planters (Hearing before a Subcommittee on the Committee on Agriculture and Forestry, U. S. Senate, 87th Congress, 2nd Session, on H. R. 946), to extend to oyster planters the benefits of the provisions of the present law which provides for production disaster loans for farmers and stockmen, July 9, 1962), 37 pp., printed. Contains the testimony from state and Federal agencies and industry people; reports from various Government agencies and congressmen; and an excerpt from the House report on the bill. Would amend the Consolidated Farmers Home Administration Act of 1961 so that it will include oyster planters as well as farmers for the purposes of obtaining an emergency loan during disaster periods.

The Senate, Oct. 1, 1962, received from the Committee on Agriculture and Forestry, without amendment a report (S. Rept. 2219) on H. R. 946, to extend to oyster planters the benefits of the provisions of the present law which provide for production disaster loans for farmers and stockmen. Would provide supplementary financial assistance to oyster producers in distressed oyster production areas.

S. Rept. 2219, Emergency Loans to Oyster Planters (Oct. 1, 1962, a report from the Committee on Agriculture and Forestry, U. S. Senate, 87th Congress, 2nd Session, to accompany H. R. 946), 6 pp., printed. The Committee favorably reported the bill and recommended passage. Contains the purpose; need for the legislation; costs; committee amendment; departmental recommendations and changes in existing law.

The Senate on Oct. 2, 1962, passed H. R. 946. The House passed the bill on April 2, 1962; therefore the bill was cleared for the President's signature.

The President on Oct. 15, 1962, signed H. R. 946 (P. L. 87-832).

NORTH PACIFIC FISHERIES PROBLEMS: On Oct. 4, 1962, Mr. Bartlett (Alaska) received the consent of the Senate to have printed in the Congressional Record a paper by Edward W. Allen, a Seattle attorney who is chairman of the International North Pacific Fisheries Commission. Mr. Allen's paper discusses the problems of conserving stocks of halibut and salmon in the North Pacific. His paper points out that different methods of conservation are needed for different species of fish. It notes that both the salmon and halibut fisheries of the Pacific coast of North America have been exclusively developed and subjected to scientific research and public regulation by the United States and Canada. The paper traces the interest of Japanese fishermen in the Bering Sea, which began in the 1930's and has continued to grow. It lists past actions to conserve North Pacific stocks of salmon and halibut such as the action of Secretary of State Cordell Hull in 1937, President Truman's fishery proclamation of Sept. 28, 1945, and the negotiations leading to the Tripartite (Canada, Japan, United States) North Pacific Fisheries Convention. The present activities of Japanese and Russian fishermen in the Bering Sea and their effect on salmon and halibut stocks are mentioned. The doctrine of "historic rights" in certain fisheries is contrasted with the idea of "freedom of the seas." It is pointed out that at the Geneva Conference on the Law of the

Sea in 1958, a substantial majority of the delegates endorsed the resolution embodying the principle of abstention. After noting the opposition of part of the Japanese fishing industry to continuation of the present Tripartite North Pacific Fisheries Convention, Allen summarizes his ideas with the statement: "If international law is to survive it must justify its usefulness to humanity and it must be sufficiently flexible to deal with realities. There are two distinct types of ocean fishery. One is unrestricted exploitation. The other is conservation regulated."

The appendix of the Congressional Record of Oct. 6, 1962 (pp. A7361-62) reported on extension of remarks by Congressman Pelly on the sound conservation principles that must be the basis of United States fisheries policy at the forthcoming November meeting of the International North Pacific Fisheries Commission, when discussions of fisheries problems of common interest with Canada and Japan take place. Included is a letter from the secretary-treasurer of Alaska's Fishermen's Union to the Under Secretary of State George Ball urging a realistic policy based on the merits of the fishery problem.

PACIFIC MARINE FISHERIES COMPACT: H. Rept. 2454, Amendment to Pacific Marine Fisheries Compact (Sept. 21, 1962, a report from the Committee on Merchant Marine and Fisheries, House of Representatives, 87th Congress, 2nd Session, to accompany S. 3431), 6 pp., printed. This bill would amend the Pacific Marine Fisheries Compact as to the participation of certain additional States in such compact. The Committee favorably reported the bill and recommended passage. Contains the purpose of the bill, background of the legislation, departmental reports, and changes in existing law.

The House Oct. 1, 1962, passed S. 3431, to consent to the amendment of the Pacific Marine Fisheries Compact and to the participation of certain additional States in such compact in accordance with the terms of such amendment. The change consists of an addition to the existing compact which provides in part: "The States of Alaska or Hawaii, or any State having rivers or streams tributary to the Pacific Ocean may become a contracting State by enactment of the Pacific Marine Fisheries compact." The Senate passed the bill on July 18, 1962, therefore the bill was cleared for the President's signature.

The President on Oct. 9, 1962, signed S. 3431 (P. L. 87-766).

POTOMAC RIVER COMPACT (MD. & VA.) OF 1958: The President on Oct. 10, 1962, signed H. J. Res. 659 (P. L. 87-783), granting consent of the Congress to a compact entered into between the State of Maryland and the Commonwealth of Virginia for the creation of the Potomac River Compact of 1958. Gives Maryland and Virginia permission to set up a Potomac River Fisheries Commission. It would regulate through three members from each State the taking of fish and shellfish from the Potomac River between the District of Columbia line and Chesapeake Bay. Research, regulation of fisheries, an oyster inspection fee and licensing would be within the power of the new commission. The compact succeeds an obsolete agreement of 1785, which has been disputed by the States.

PRICE-QUALITY STABILIZATION: Quality Stabilization (Hearings before a Subcommittee of the Committee on Commerce, United States Senate, 87th Congress, 2nd Session, on S. J. Res. 159), a joint resolution to a-

mend the Federal Trade Commission Act, to promote quality and price stabilization, to define and restrain certain unfair methods of distribution and to conform, define, and equalize the rights of producers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes), 477 pp., printed. Reports on hearings held April 9, 19, 23, May 24 and 25, 1962; contains statements received from various Federal agencies and industry people, and letters submitted to the Committee.

On Oct. 3, 1962, the House Committee on Rules reported (H. Rept. 2520) to the House a resolution (H. Res. 825) for consideration of H. J. Res. 636, to amend the Federal Trade Commission act, to promote quality and price stabilization, to define and restrain certain unfair methods of distribution and to confirm, define, and equalize the rights of producers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes; without amendment. Referred to the House Calendar.

SALMON IMPORT RESTRICTIONS: The House Oct. 1, 1962, received a report (H. Rept. 2498) from the Committee on Merchant Marine and Fisheries on H. R. 9547, to facilitate the application and operation of the Fish and Wildlife Act of 1956 and for other purposes. Would prohibit the import of salmon products derived from fish caught by nationals of any country that permits fishing for salmon by gill nets on the high seas at times and places where occur large quantities of immature salmon of North American origin. Referred to the Committee of the Whole House on the State of the Union.

H. Rept. 2498, Facilitating the Application and Operation of the Fish and Wildlife Act of 1956 (Oct. 1, 1962, a report from the Committee on Merchant Marine and Fisheries, House of Representatives, 87th Congress, 2nd Session, to accompany H. R. 9547, to facilitate the application and operation of the Fish and Wildlife Act of 1956, and for other purposes), 4 pp., printed. The Committee favorably reported the bill and recommended passage with amendment. Contains purpose of the bill, background of the legislation, cost of the legislation, changes in existing law, and departmental reports.

SPORT FISH RESEARCH: Fish and Wildlife Legislation (Hearings before a Subcommittee of the Committee on Commerce, U. S. Senate, 87th Congress, 2nd Session), 109 pp., printed. Contains hearings held July 9 and 18, 1962, on S. 1642, to authorize and direct the Secretary of the Interior to conduct studies of the genetics of sport fishes and to carry out selective breeding of such fishes to develop strains with inherent attributes valuable in programs of research, fish hatchery production, and management of recreational fishery resources; reports of various Federal agencies; testimony of various State and Federal agencies, U. S. Senators and industry organizations; and statements submitted to the committee.

STATE DEPARTMENT APPROPRIATIONS: Departments of State, Justice, and Commerce, the Judiciary, and Related Agencies Appropriations, 1963 (Hearings before the Subcommittee of the Committee on Appropriations, U. S. Senate, 87th Congress, Second Session, to accompany H. R. 12580), 776 pp., printed. Contains hearings held on making appropriations for the Departments of State, Justice, and Commerce, the Judiciary, and Related Agencies for the fiscal year

ending June 30, 1963. Included in the appropriations for the Department of State are funds for the international fisheries commissions. Testimony was heard from various personnel from the State Department, and letters and communications were submitted to the Committee.

The Subcommittees of the Senate Committee on Appropriations, in executive session, Sept. 28, 1962, marked up and approved for full committee consideration with amendments H. R. 12580, making appropriations for the Departments of State, Justice, and Commerce, the Judiciary, and related agencies for fiscal year 1963. Included in the appropriations for the Department of State are funds for the international fisheries commissions.

The Senate received from the Committee on Appropriations on Oct. 1, 1962, a favorable report (S. Rept. 2226) on H. R. 12580 (with amendments).

S. Rept. 2226, Departments of State, Justice, and Commerce, the Judiciary, and Related Agencies Appropriation Bill, 1963 (Oct. 1, 1962, a report from Committee on Appropriations, U. S. Senate, 87th Congress, 2nd Session, to accompany H. R. 12580), 38 pp., printed. The Committee under the Department of State appropriations recommended \$2,082,000 for international fisheries commissions. This is an increase of \$172,000 over the House bill and the 1962 appropriation, but \$83,000 under the 1963 budget estimate. The funds would enable the United States to meet its share of expenses of the eight international fisheries commissions.

The Senate passed with amendments on Oct. 3, 1962, H. R. 12580. Senate insisted on its amendments, asked for conference with House, and appointed conferees. This bill was passed by the House on July 20, 1962. On Oct. 3, the House disagreed to Senate amendments, agreed to conference requested by Senate, and appointed conferees.

Conferees, in executive session, on Oct. 5, 1962, agreed to file a conference report on the differences between the Senate- and House-passed H. R. 12580.

The House on Oct. 8, 1962, received the conference report (H. Rept. 2546) on H. R. 12580.

H. Rept. 2546, Departments of State, Justice, and Commerce, the Judiciary and Related Agencies Appropriation Bill, 1963 (Oct. 8, 1962, a report from the Committee of Conference, House of Representatives, 87th Congress, 2nd Session to accompany H. R. 12580), 8 pp., printed. The Committee under the Department of State appropriations recommended \$1,910,000 for international fisheries commissions as proposed by the House instead of \$2,082,000 as proposed by the Senate.

The Senate and the House on Oct. 10, 1962, adopted the conference report (H. Rept. 2546) on H. R. 12580. The Conference action agreed on \$1,910,000 appropriations for the international fisheries commissions, the same as the 1962 appropriations and the same as the 1963 House bill. This was less than the \$2,165,000 in the 1963 revised budget estimates and also less than the Senate version of the bill that had allowed \$2,082,000. The President on Oct. 18, 1962, signed H. R. 12580 (P. L. 87-843).

SUPPLEMENTAL APPROPRIATIONS 1963: Supplemental Appropriations for 1963 (Hearings before the

Subcommittee of the Committee on Appropriations, House of Representatives, 87th Congress, 2nd Session), 515 pp., printed. Contains hearings held on proposed supplemental appropriations for the fiscal year 1963. Included are funds for the Bureau of Commercial Fisheries in the sum of \$500,000 to finance the development and perfection of commercial techniques for the production of fish protein concentrate. Also contains the statements of various Federal agencies and others as submitted to the Committee.

H. R. 13290 (Thomas) introduced in the House on Oct. 1, 1962, making supplemental appropriations for the fiscal year ending June 30, 1963, and for other purposes. The Committee on the same date reported the bill favorably (H. Rept. 2507); referred to the Committee of the Whole House on the State of the Union. Included in the appropriations for the Department of the Interior was an allocation of \$500,000 for the Bureau of Commercial Fisheries, for research and development of processes to produce a concentrated protein from fish. The Committee report (H. Rept. 2507) recommended only \$375,000 instead of the \$500,000 asked by the President in his communication (H. Doc. 514). The House on Oct. 3, 1962, passed the bill.

The Senate Committee on Appropriations on Oct. 1, 1962, started hearings on the proposed supplemental appropriations for fiscal year 1963. Testimony was heard from various Interior Department personnel including a representative from the Bureau of Commercial Fisheries and other Federal agencies. The Senate on Oct. 4, 1962, received the bill (H. R. 13290) from the House; referred to the Committee on Appropriations. The Committee favorably reported the bill to the Senate, Oct. 8, 1962 (S. Rept. 2285). The Senate Committee recommended an appropriation of \$500,000 for development and perfection of commercial techniques for the production of fish protein concentrate. This is a matter of great importance to the fishing industry of the United States; and success in the program will result in a food supplement much needed throughout the world, reported the Committee. Although the House directed that \$125,000 of the requested amount be available from unallocated Saltonstall-Kennedy funds, such funds will not be available because of the impending employee pay increase. The Bureau will have to absorb the pay increase, and is not permitted to request additional funds to cover it. To use the Saltonstall-Kennedy funds, therefore, will mean a reduction in other current programs, pointed out the Committee.

H. Rept. 2507, Supplemental Appropriation Bill, 1963 (Oct. 1, 1962, report of the Committee on Appropriations, House of Representatives, 87th Congress, 2nd Session, to accompany H. R. 13290), 15 pp., printed. The Committee considered budget estimates totaling \$648,436,980 and is recommending for appropriation \$404,497,880. Included are funds for the Bureau of Commercial Fisheries--the Committee recommends an appropriation of \$375,000 for research and development of processes to produce a concentrated protein from fish. This amount together with the \$125,000 carryover and unallocated funds available under the permanent appropriation of customs duties on fishery products (Saltonstall-Kennedy Funds) will provide a total of \$500,000, the same as the requested amount, reported the Committee.

S. Rept. 2285, Supplemental Appropriation Bill, 1963 (Oct. 8, 1962, a report from the Committee on Appropriations, U. S. Senate, 87th Congress, 2nd Session, to accompany H. R. 13290), 32 pp., printed. The Commit-

tee recommended various amendments and recommended passage. The Committee restored to the Bureau of Commercial Fisheries the full amount requested--\$500,000--for the development and perfection of commercial techniques for the production of fish protein concentrate.

On Oct. 12, 1962, Congressman Thomas requested that the bill H. R. 13290, making supplemental appropriations for the fiscal year ending June 30, 1963, and for other purposes, be taken from the Speaker's table, that the House disagree to the Senate amendments and agree to the conference asked by the Senate. Congressman Cannon objected, therefore no action was taken. As a result, the bill is "dead" and will have to be reintroduced in the Eighty-Eighth Congress if it is to be considered.

TRADE EXPANSION ACT OF 1962: Trade Expansion Act of 1962 (Hearings before the Committee on Finance, U. S. Senate, 87th Congress, 2nd Session, on H. R. 11970, to promote the general welfare, foreign policy, and security of the United States through international trade agreements and through adjustment assistance to domestic industry, agriculture, and labor, and for other purposes), printed in 5 parts, Part I (July 23, 24, 25, and 26, 1962), 512 pp.; Part II (July 30, 31, August 1, 2, and 6, 1962), 533 pp.; Part III (August 7, 8, 9, and 10, 1962), 611 pp.; Part IV (August 13, 14, 15, and 16, 1962), 646 pp.; and Part V (Index to hearings), 13 pp. Contains a brief analysis of the Trade Expansion Act as passed by the House; text of the bill; departmental reports; testimony of the various Government officials and members of industry; and communications submitted to the Committee.

Foreign Trade (Hearings before the Committee on Commerce, U. S. Senate, 87th Congress, 2nd Session), 100 pp., printed. Contains hearings held on April 3, 4, and May 7, 1962, pertaining to the development of foreign trade by American exporters and problems of foreign trade in general; testimony of various Federal agencies and statements submitted to the Committee from industry. The Director of the Bureau of Commercial Fisheries in his testimony to the Committee stated that the Department of the Interior is encouraging the export of fishery products to its best ability. Some of the major highlights of his statement were: economic importance of exports to the United States fishing industry, some factors affecting U. S. fishery exports, current export promotion program, and expanded export promotion program.

On Sept. 28, 1962, the President sent to Congress a message proposing appropriations totaling \$10.2 million for expenses under the Act this fiscal year. Of the total, \$1,450,000 would be for trade adjustment assistance activities by the Commerce Department, \$3,741,000 for trade adjustment programs of the Labor Department, and \$5 million to provide funds for Small Business Administration loans to firms injured by import competition.

The House on Oct. 2, 1962, received from the Committee of Conference the report (H. Rept. 2518) on H. R. 11970.

The House and the Senate on Oct. 4, 1962, adopted the conference report (H. Rept. 2518) on H. R. 11970. The bill was cleared for the President's signature.

H. Rept. 2518, Trade Expansion Act of 1962 (Oct. 2, 1962, a report from the Committee of Conference, House of Representatives, 2nd Session, 87th Congress

to accompany H. R. 11970), 13 pp., printed. The Committee of Conference having reached agreement recommended to their respective Houses passage of the bill. Contains statement of the managers on the part of the House and the amendments.

On Oct. 11, 1962, the President signed H. R. 11970 (P.L. 87-794).

As enacted, the key provisions of the law are: (1) The President has authority to cut all tariffs as much as 50 percent in the next five years. (2) He has the power to eliminate tariffs as much as he wants to on products in which the United States and Western Europe account for most of the world trade. (3) He is empowered to negotiate tariff reductions on entire categories of commodities, instead of item-by-item as at present. (4) A new program of subsidies is established to serve as a substitute for tariff protection for workers and firms which would be hurt by actions taken under the legislation to reduce tariffs on the things they make. These companies, injured by foreign competition, could receive loans and workers, made idle under these circumstances, could receive cash payments as high as \$61 a week for as long as 78 weeks.

TRANSPORTATION BILLS: Proposed Amendments to Federal Transportation Laws (Hearings before the Committee on Commerce, U. S. Senate, 87th Congress, 2nd Session, on S. 3242, to provide for strengthening and improving the national transportation system, and for other purposes; and S. 3243, to exempt certain carriers from minimum rate regulation in the transportation of bulk commodities, agricultural and fishery products, and passengers, and for other purposes), Part 1, 224 pp., printed. Contains statements of Government witnesses, reports from Federal agencies, and the President's message "The Transportation System of our Nation."

TUNA CONVENTION ACT AMENDMENT: Conservation of Tropical Tuna (Hearings before the Subcommittee on Inter-American Affairs of the Committee on Foreign Affairs, House of Representatives, 87th Congress, 2nd Session), 108 pp., printed. Contains hearings held on Aug. 14, 28, and 30, 1962, on S. 2568, to amend the act of September 7, 1950, to extend the regulatory authority of the Federal and State agencies concerned under the terms of the Convention for the Establishment of an Inter-American Tropical Tuna Commission, signed at Washington, May 31, 1949, and for other purposes; testimony of representatives of the Bureau of Commercial Fisheries, State Department, and various industry associations; and statements and affidavits submitted to the Committee.

The House Oct. 1, 1962, passed with amendments S. 2568, to amend the act of Sept. 7, 1950, to extend the regulatory authority of the Federal and State agencies concerned under the terms of the Convention for the Establishment of an Inter-American Tropical Tuna Commission signed at Washington May 31, 1949, and for other purposes. Would provide for the issuance and enforcement of Federal regulations to carry out recommendations of the Commission for the conservation of tuna (especially yellowfin) resources in the eastern Pacific.

The Senate on Oct. 2, 1962, concurred with the House amendments to S. 2568. The House passed the bill on Oct. 1, 1962.

On Oct. 15, 1962, the President signed S. 2568 (P.L. 87-814).

Public Law 87-814
87th Congress, S. 2568.
October 15, 1962

An Act

76 STAT. 923.

To amend the Act of September 7, 1950, to extend the regulatory authority of the Federal and State agencies concerned under the terms of the Convention for the Establishment of an Inter-American Tropical Tuna Commission, signed at Washington May 31, 1949, and for other purposes.

It is enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section 2 of the Tuna Conventions Act entitled "Tuna Conventions Act of 1950" (16 U.S.C. 931) is amend as follows:

(e) (1) The United States shall include all areas under the sovereignty of the United States, the True Territory of the Pacific Islands, and the Canal Zone;

(2) Section 6 of the Act entitled "Tuna Conventions Act of 1950" (16 U.S.C. 935) is amended by striking out the phrase "head of the enforcement agency" where it appears once each in subsections (a) and (b) and inserting in lieu thereof in both places the term "Secretary of the Interior"; and by adding a new subsection (c) immediately following subsection (b);

(c) Regulations required to carry out the recommendations of the Regulations commission made pursuant to paragraph 5 of article II of the Convention for the Establishment of an Inter-American Tropical Tuna Commission shall be promulgated as hereinafter provided by the Secretary of the Interior upon approval of the recommendations by the Secretary of the Interior and the Secretary of the Treasury. The publication in the Federal Register of such regulations shall cause to be published in the Federal Register, F. R. general notice of proposed rulemaking and shall afford interested persons an opportunity to participate in the rulemaking through (1) submission of written data, views, or arguments, and (2) oral presentation at a public hearing. Such regulations shall be published in the Federal Register and shall become effective by a concurrence of the consideration involved in the issuance of such regulations. After publication in the Federal Register such regulations shall be applicable to all vessels and persons subject to the jurisdiction of the United States on such date as the Secretary of the Interior shall prescribe, but in an event prior to an agreed date for the application by all countries whose vessels engage in fishing for species covered by the convention which may be required by the Secretary of the Interior to implement the success of the conservation program, of effective measures for the implementation of the commission's recommendations applicable to all vessels and persons subject to their respective jurisdictions. The Secretary of the Interior shall suspend at any time the application of any such regulations when, after consultation with the Secretary of the Interior, it is determined by the Secretary of the Interior that fishing operations in the regulatory area, as such, as to constitute a serious threat to the achievement of the objectives of the commission's recommendations. The regulations thus promulgated may include the selection for regulation of one or more of the species covered by the convention; the division of the convention waters into management units or areas or closed areas as to such area; the limitation on the size of the fish and quantity of the catch which may be taken from such area within any season during which fishing is allowed; the limitation or prohibition of the incidental catch of a regulated species which may be retained, taken, possessed, or landed by vessels or persons fishing for other species of fish; the requiring of such clearance certificates for vessels as may be necessary to carry out the purposes of the convention and this Act; and such other measures incidental thereto as the Secretary of the Interior may

76 STAT. 924.

deem necessary to implement the recommendations of the commission. Provided, That upon the promulgation of any such regulations the Secretary of the Interior shall promulgate additional regulations, with the concurrence of the Secretary of State, which shall become effective simultaneously with the application of the regulations hereinbefore referred to (1) to prohibit the entry into the United States, from any country when the vessels of such country are being used in the conduct of fishing operations in the regulatory area; and (2) to prohibit entry into the United States, from any country, when the vessels of such country as would tend to diminish the effectiveness of the conservation recommendations of the commission, of fish in any form of those species which are subject to regulation pursuant to a recommendation of the commission and which were taken from the regulatory area; and (2) to prohibit entry into the United States, from any country, of fish in any form of those species which are subject to regulation pursuant to a recommendation of the commission and which were taken from the regulatory area by vessels other than those of such country in such manner or in such circumstances as would tend to diminish the effectiveness of the conservation recommendations of the commission. In the case of repeated and flagrant fishing operations in the regulatory area by the vessels of any country which subsequently violates the recommendations of the commission, the Secretary of the Interior, with the concurrence of the Secretary of State, may, in his discretion, also prohibit the entry from such country of such other species of tuna, in any form, as may be under investigation by the commission and which were taken in the regulatory area. The aforesaid prohibitions shall remain in effect until the Secretary of the Interior is satisfied that the condition warranting the prohibited no longer exists, except that all fish in any form of the species under regulation which were previously prohibited from entry shall continue to be prohibited from entry.

64 Stat. 778.

Sec. 3. Section 7 of the Act entitled "Tuna Conventions Act of 1950" (16 U.S.C. 958) is amended by deleting the section in its entirety and substituting in lieu thereof the following:

"Sec. 7. Any person authorized to carry out enforcement activities under this Act and any person authorized by the commissions shall have power without warrant or other process, to inspect, at any reasonable time, catch returns, statistical records, or other reports as are required by regulations adopted pursuant to this Act to be made, kept, or filed.

Sec. 4. Section 8 of the Act entitled "Tuna Conventions Act of 1950" (16 U.S.C. 957) is amended by deleting the section in its entirety and substituting in lieu thereof the following:

"Sec. 8. (a) It shall be unlawful for any master or other person in charge of a fishing vessel of the United States to engage in fishing in, with, or near, any restricted area, pursuant to section 6(c) of this Act, or for any person knowingly to ship, transport, purchase, sell, offer for sale, import, export, or have in custody, possession, or control any fish taken or retained in violation of such regulations.

"(b) It shall be unlawful for the master or any person in charge of any fishing vessel of the United States or any person on board such vessel, to fail to make, or to refuse to make, any record, statistical records, or other reports as may be required by regulations adopted pursuant to this Act to be made, kept, or furnished; or to fail to stop upon being hailed by a duly authorized official of the United States; or to refuse to permit the duly authorized officials of the United States or authorized officials of the commissions to board such vessel or inspect its catch, equipment, books, documents, records, or other articles or quantities of fish persons on board in accordance with the provisions of this Act, or the convention, as the case may be.

76 Stat. 925.

Ante, p. 923.

"(c) It shall be unlawful for any person to import, in violation of any regulation adopted pursuant to section 6(c) of this Act, from any country, any fish in any form of those species subject to regulation pursuant to a recommendation of the commission, or any tuna in any form not under regulation but under investigation by the commission, during the period such fish have been denied entry in accordance with the provisions of section 6(c) of this Act. In the case of any fish as is referred in this subsection offered for entry into the United States, the Secretary of the Interior shall require proof satisfactory to him that such fish is not ineligible for such entry under the terms of section 6(c) of this Act.

"(d) Any person violating any provision of subsection (a) of this section shall be fined not more than \$25,000, and for a subsequent violation of any provisions of said subsection (a) shall be fined not more than \$50,000.

"(e) Any person violating any provision of subsection (b) of this section shall be fined not more than \$1,000, and for a subsequent violation of any provision of subsection (b) shall be fined not more than \$5,000.

"(f) Any person violating any provision of subsection (c) of this section shall be fined not more than \$10,000.

"(g) All fish taken or retained in violation of subsection (a) of this section, or the monetary value thereof, may be forfeited.

"(h) All provisions of law relating to the seizure, judicial forfeiture, and condemnation of a cargo for violation of the customs laws, the disposition of such cargo or the proceeds from the sale thereof, and the costs of removal, mitigation, or such forth, incurred shall be liable to seizures and forfeitures incurred, or alleged to have been incurred, under the provisions of this Act, insofar as such provisions of law are applicable and not inconsistent with the provisions of this Act."

Sec. 5. Section 10 of the Act entitled "Tuna Conventions Act of 1950" (16 U.S.C. 959) is amended by deleting the section in its entirety and substituting in lieu thereof the following:

"Sec. 5. (a) The judges of the United States district courts and United States commissioners may, within their respective jurisdictions, upon proper oath or affirmation showing probable cause, issue such warrants or other process as may be required for enforcement of this Act and the regulations issued pursuant thereto.

"(b) Enforcement of the provisions of this Act and the regulations issued pursuant thereto shall be the joint responsibility of the United States Coast Guard, the United States Department of the Interior, and the United States Bureau of Customs. In addition, the Secretary of the Interior may designate officers and employees of the States of the United States, of the Commonwealth of Puerto Rico, and of American Samoa to carry out enforcement activities as he deems necessary. When so designated such officers and employees are authorized to function as Federal law enforcement agents for these purposes.

"(c) Any person authorized to carry out enforcement activities hereunder shall have the power to execute any warrant or process issued by any officer or court of competent jurisdiction for the enforcement of this Act.

"(d) Such person so authorized shall have the power—

"(1) with or without a warrant or other process, to arrest any person subject to the jurisdiction of the United States at any place within the jurisdiction of the United States committing in his presence or view a violation of this Act or the regulations issued thereto;

"(2) with or without a warrant or other process, to search any vessel subject to the jurisdiction of the United States, and, if as a result of such search he has reasonable cause to believe that such

Violations.

76 STAT. 926.

vessel or any person on board is engaging in operations in violation of the provisions of this Act or the regulations issued thereunder, then to arrest such person.

"(e) Such person so authorized may seize, whenever and wherever lawfully found, all fish taken or retained in violation of the provisions of this Act or the regulations issued pursuant thereto. Any fish so seized may be disposed of pursuant to the order of a court of competent jurisdiction, pursuant to the provisions of subsection (f) of this section, or, if permissible, in a manner prescribed by regulations of the Secretary of the Interior.

"(f) Notwithstanding the provisions of section 2464 of title 28 of the United States Code, when a warrant of arrest or other process is issued in any cause under this section, the marshal or other officer shall seize and examine such property, or discharge any fish seized if it cannot be less than value of the property with sufficient surety to be approved by a judge of the district court having jurisdiction of the offense, conditioned to deliver the fish seized, if condemned, without impairment in value or, in the discretion of the court, at its equivalent value in money, or otherwise to answer the debts of the accused, in money. Such bond or other security shall be returned to the court and judgment thereon against both the principal and sureties may be recovered in event of any branch of the conditions thereof as determined by the court. In the discretion of the accused, and subject to the direction of the court, the fish may be sold for not less than its reasonable market value and the proceeds of such sale placed in the registry of the court pending judgment of the case.

Sec. 8. Nothing in this Act shall be construed to amend or repeal the provisions of section 4311 of the Revised Statutes, as amended (46 U.S.C. 251).

The Department of the Interior has published in the Federal Register of Oct. 18, 1962, proposed regulations for the eastern Pacific yellowfin tuna fishery.

VESSEL REPLACEMENT PROBLEMS: The following statement by Mr. Tollefson (Washington) appeared in the Appendix of the Congressional Record, Oct. 8, 1962 (p. A7462):

"Mr. Speaker, according to the August 31 issue of the Fishing News, London, 14 German fishing trawlers are being scrapped. These vessels are termed 'obsolete.' They were built: one in 1953; one in 1951; seven in 1949; one in 1948; one in 1944; one reconditioned in 1941, and so forth.

"Unfortunately, we in the United States do not regard vessels of this age as obsolete. Many of our trawlers are twice as old as the oldest German trawler being scrapped. Still worse is the fact that we cannot scrap our old vessels for the simple reason that we cannot build new ones at double the cost our friends in Germany, Japan, and the rest of the world can build them. This constitutes one more urgent reason for Congress to enact legislation in the next Congress, if the United States is to continue in the business of producing fish. Otherwise, we shall yield the resources of the high seas to other nations who have forced us from the second highest producing nation to the fifth in a matter of 3 years."

VESSEL COLLISION LIABILITY: The Senate on Sept. 28, 1962, agreed to postpone indefinitely action on S. 2313, to unify apportionment of liability in cases of collision between vessels, and related casualties.

VESSEL OWNERS LIABILITY: The Senate on Sept. 28, 1962, agreed to postpone indefinitely action on S. 2314, to limit the liability of shipowners, and for other purposes.



64 Stat. 779.

Enforcement.

Sec. 6. (a) The judges of the United States district courts and United States commissioners may, within their respective jurisdictions, upon proper oath or affirmation showing probable cause, issue such warrants or other process as may be required for enforcement of this Act and the regulations issued pursuant thereto.

"(b) Enforcement of the provisions of this Act and the regulations issued pursuant thereto shall be the joint responsibility of the United States Coast Guard, the United States Department of the Interior, and the United States Bureau of Customs. In addition, the Secretary of the Interior may designate officers and employees of the States of the United States, of the Commonwealth of Puerto Rico, and of American Samoa to carry out enforcement activities as he deems necessary. When so designated such officers and employees are authorized to function as Federal law enforcement agents for these purposes.

"(c) Any person authorized to carry out enforcement activities hereunder shall have the power to execute any warrant or process issued by any officer or court of competent jurisdiction for the enforcement of this Act.

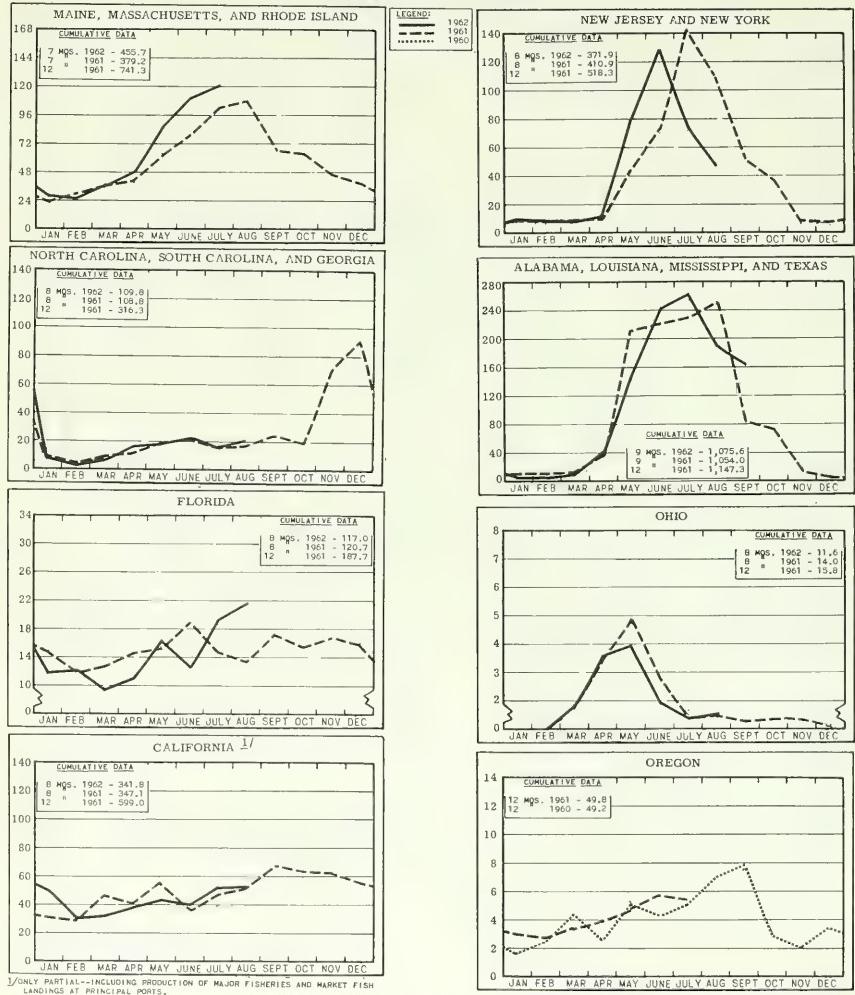
"(d) Such person so authorized shall have the power—

"(1) with or without a warrant or other process, to arrest any person subject to the jurisdiction of the United States at any place within the jurisdiction of the United States committing in his presence or view a violation of this Act or the regulations issued thereto;

"(2) with or without a warrant or other process, to search any vessel subject to the jurisdiction of the United States, and, if as a result of such search he has reasonable cause to believe that such

FISHERY INDICATORS

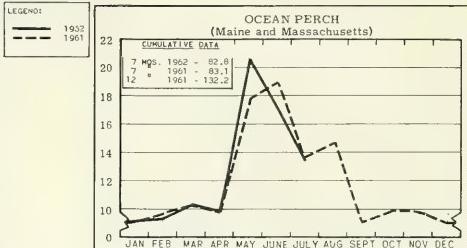
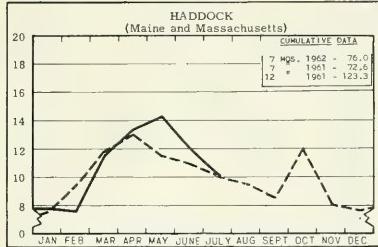
CHART I - FISHERY LANDINGS for SELECTED STATES
In Millions of Pounds



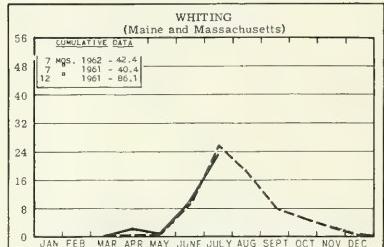
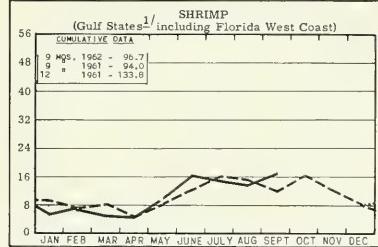
1/ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

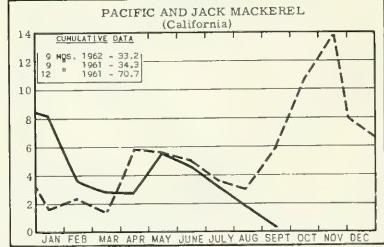
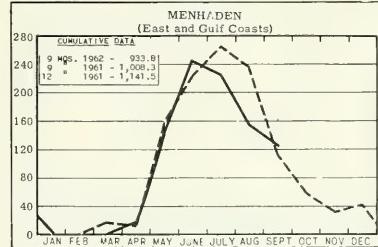


In Millions of Pounds



^{1/}LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



In Thousands of Tons

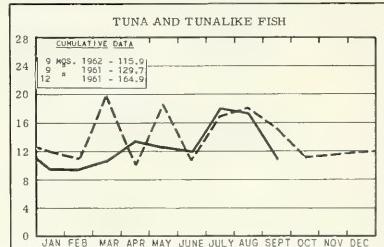
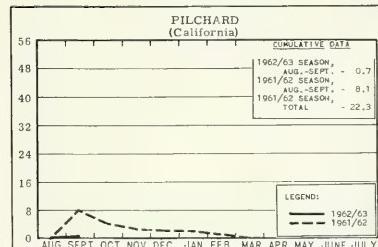
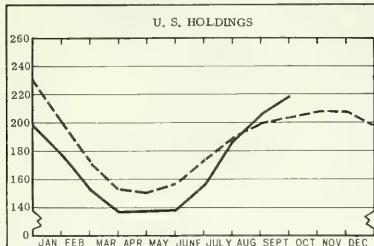
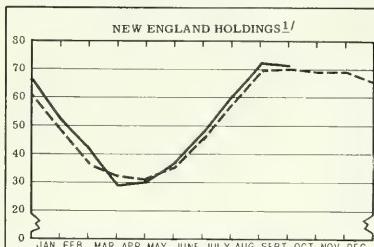
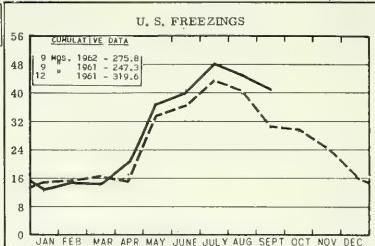


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

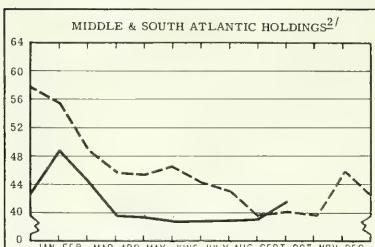
In Millions of Pounds



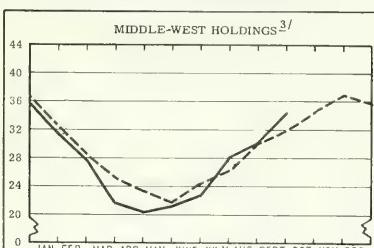
LEGEND:
— 1962
- - - 1961



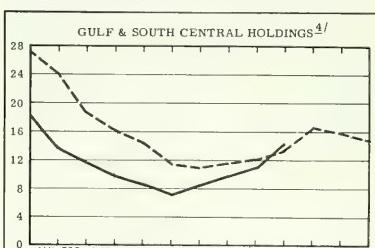
^{1/}MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT



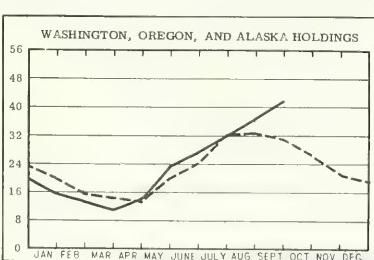
^{2/}ALL EAST COAST STATES FROM N. Y. SOUTH.



^{3/}OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., KAN., NEBR., & KANS.



^{4/}ALA., MISS., LA., TEX., ARK., KY., & TENN.



* Excludes salted, cured, and smoked products.

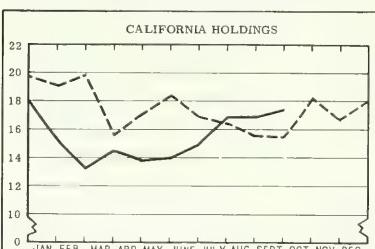
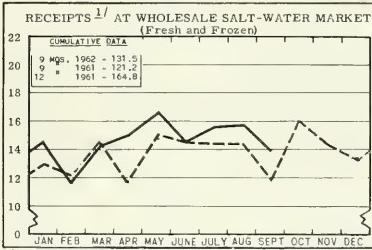


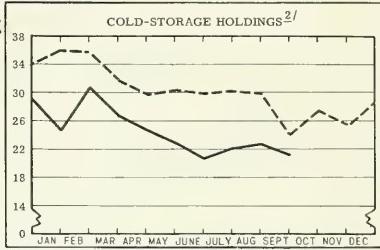
CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

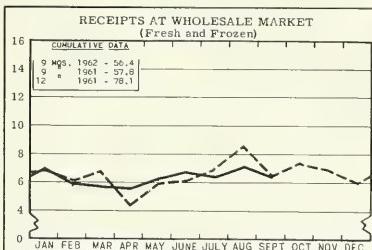


^{1/}INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

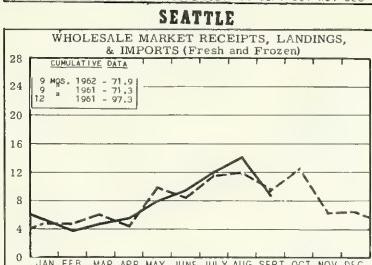
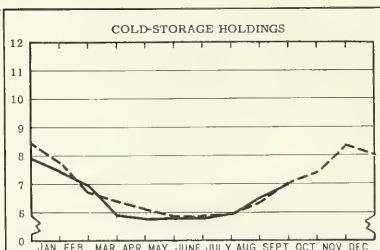
NEW YORK CITY



^{2/}AS REPORTED BY PLANTS IN METROPOLITAN AREA.



CHICAGO



LEGEND:

— 1962
- - - 1961

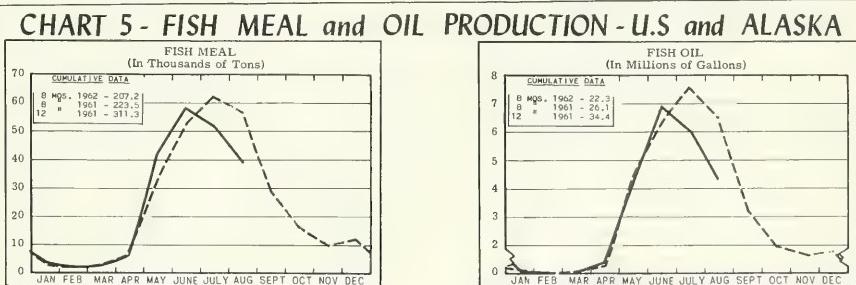
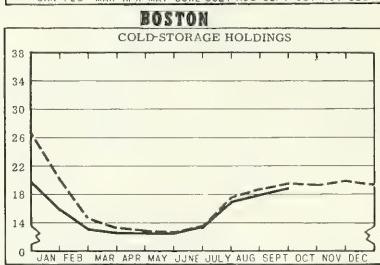
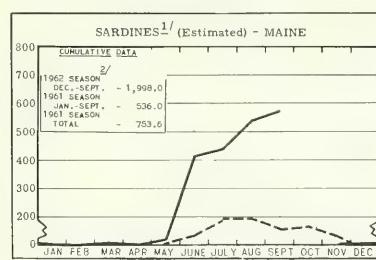
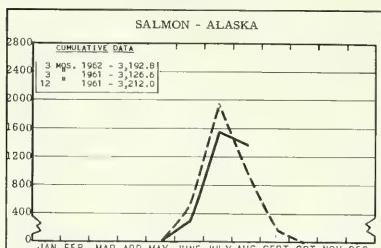
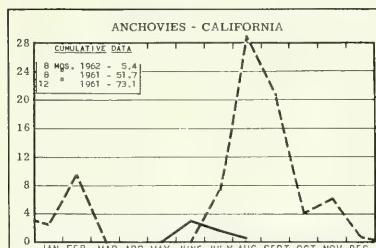
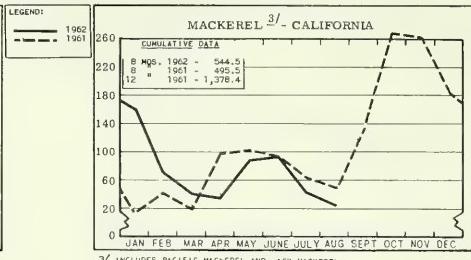
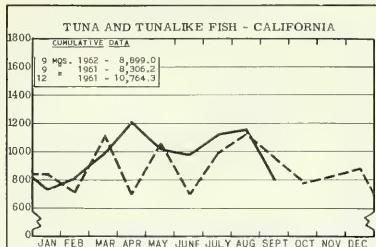


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases



^{1/} INCLUDING SEA HERRING. ^{2/} THE 1962 SEASON STARTED DEC. 2, 1961.

STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	$\frac{1}{4}$ drawn	3 $\frac{1}{2}$ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# $\frac{1}{2}$ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	$\frac{1}{2}$ lb.	8 oz.

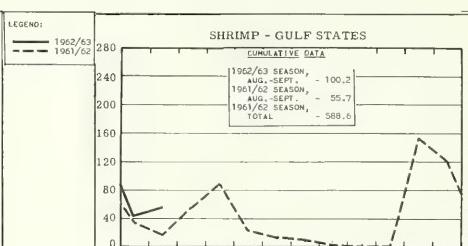
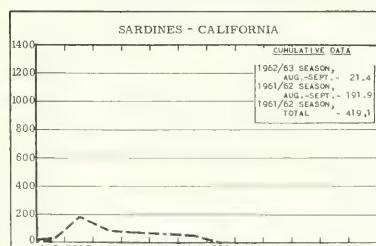
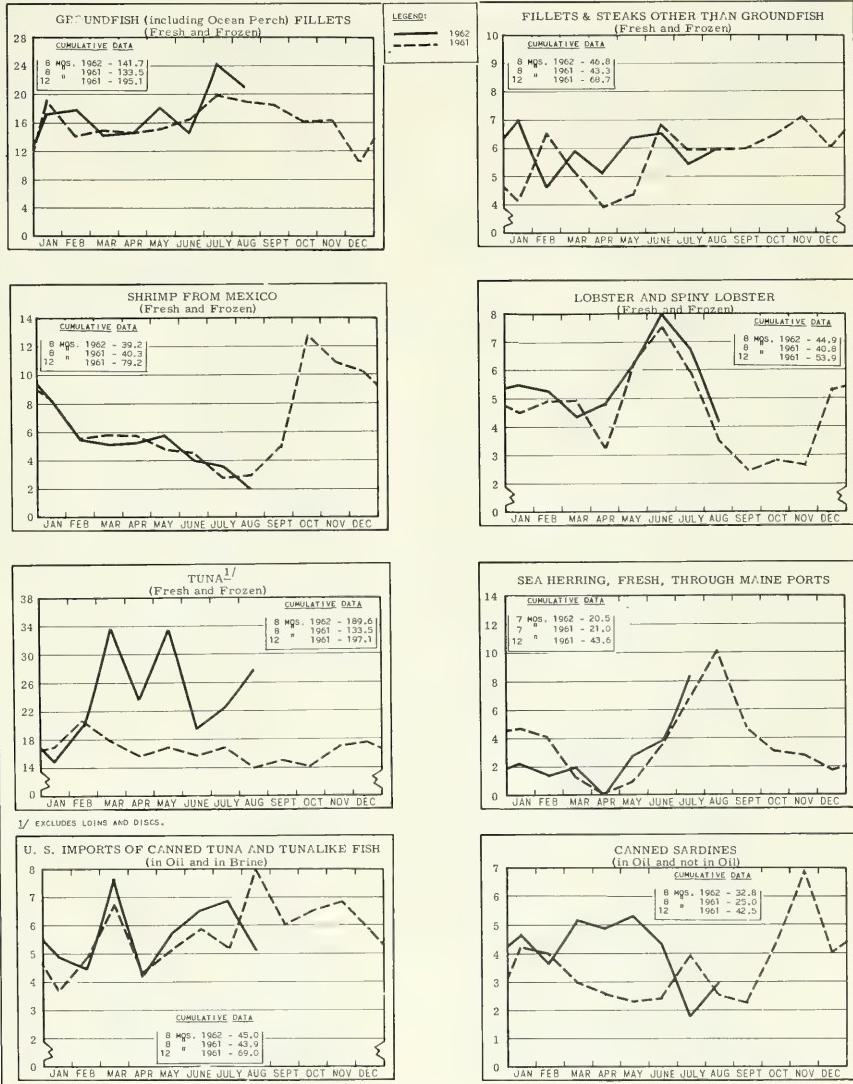
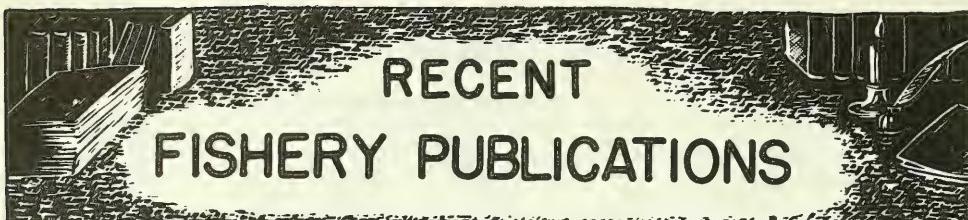


CHART .7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds





FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
MNL - REPRINTS OR REPORTS ON FOREIGN FISHERIES.
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
SSR - FISH, - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).
WL - WILDLIFE LEAFLETS.

Number	Title
CFS-2877	- Massachusetts Landings by Ports, 1961 Annual Summary, 14 pp.
CFS-2954	- New Jersey Landings, June 1962, 3 pp.
CFS-2955	- Massachusetts Landings, March 1962, 5 pp.
CFS-2957	- Shrimp Landings, 1961 Annual Summary, 21 pp.
CFS-2959	- Rhode Island Landings, May 1962, 3 pp.
CFS-2960	- Frozen Fish Report, July 1962, 8 pp.
CFS-2961	- Mississippi Landings, May 1962, 3 pp.
CFS-2962	- Maryland Landings, June 1962, 3 pp.
CFS-2963	- Virginia Landings, June 1962, 3 pp.
CFS-2964	- California Landings, April 1962, 4 pp.
CFS-2965	- Shrimp Landings, March 1962, 6 pp.
CFS-2966	- Massachusetts Landings, April 1962, 5 pp.
CFS-2967	- Fish Meal and Oil, June 1962, 2 pp.
CFS-2969	- Maine Landings, June 1962, 4 pp.
CFS-2970	- California Landings, May 1962, 4 pp.
CFS-2971	- Ohio Landings, June 1962, 2 pp.
CFS-2972	- Wisconsin Landings, June 1962, 2 pp.
CFS-2973	- Michigan Landings, May 1962, 3 pp.
CFS-2974	- New York Landings, June 1962, 4 pp.
CFS-2975	- California Landings, June 1962, 4 pp.
CFS-2976	- Rhode Island Landings, June 1962, 3 pp.
CFS-2978	- Texas Landings, May 1962, 3 pp.
CFS-2979	- South Carolina Landings, July 1962, 2 pp.
CFS-2981	- Georgia Landings, June 1962, 2 pp.
CFS-2982	- Georgia Landings, July 1962, 2 pp.
CFS-2983	- Mississippi Landings, June 1962, 3 pp.
CFS-2984	- Maryland Landings, July 1962, 3 pp.
CFS-2985	- Shrimp Landings, April 1962, 6 pp.
CFS-2988	- North Carolina Landings, July 1962, 3 pp.
CFS-2990	- Florida Landings, July 1962, 8 pp.

FL-534 - Marking and Tagging Fishes, by Albert C. Jensen, 8 pp., illus., March 1962. Discusses the two most common techniques of marking fish, fin clipping and tagging. Describes the most widely used types of tags, a tagging method representative of that used for many species of fish, and ob-

jectives of marking and tagging studies. Includes illustrations of methods of attaching different types of tags.

Sep. No. 657 - A Method of Predicting Fluctuations in the Sea Scallop Populations of Maine.

Sep. No. 658 - Accuracy of Net-Weight Determinations for Frozen Glazed Halibut Steaks.

SL-21 - Wholesale Dealers in Fishery Products, California, 1962, 7 pp. (Revised).

Firms Canning, 1961 (Revised):

- SL-102 - Maine Sardines, 1 p.
- SL-102A - Pacific Sardines, 1 p.
- SL-103 - Tuna, 2 pp.
- SL-103A - Tunalike Fishes, 1 p.
- SL-104 - Mackerel, 1 p.
- SL-105 - Alewives, 1 p.
- SL-106 - Shad, 1 p.
- SL-107 - Fish and Shellfish Specialties, 5 pp.
- SL-109 - Caviar and Fish Roe, 2 pp.
- SL-110 - Oysters, 2 pp.
- SL-116 - Food for Animals from Marine-Animal Products, 2 pp.
- SL-119 - Squid, 1 p.

Firms Manufacturing, 1961 (Revised):

- SL-154 - Seaweed Products, 1 p.
- SL-155 - Marine Pearl Shell Buttons, 1 p.
- SL-156 - Pearl Essence, 1 p.
- SL-159 - Fresh-Water Mussel-Shell Products, 1 p.
- SL-160 - Menhaden Products, 2 pp.

SL-161 - Producers of Packaged Fish, 1961, 7 pp. (Revised).

SSR-Fish, No. 409 - Conversion of "Whole" and "Headless" Weights in Commercial Gulf of Mexico Shrimps, by Joseph H. Kutkuhn, 8 pp., illus., March 1962. Discusses a statistical survey on the conversion of commercial catch statistics tabulated according to weight from "headless" or "heads-off" terms back to "whole" or "heads-on" units. Measurements of whole and corresponding headless weights permitted estimation of weight conversion factors for five of the most common Gulf of Mexico shrimp. Equations and factors for predicting whole or headless weights are given for brown, white, pink, and rock shrimp, and seabob. Nomographs which facilitate the conversion of individual whole or headless shrimp on a simple weight or number-per-pound basis are provided for brown, white, and pink shrimp.

WL-444 - Fur Catch in the United States, 1961, 4 pp., June 1962.

Annual Report of the Commissioner Fish and Wildlife Service to the Secretary of the Interior, 44 pp., illus., printed. (Reprinted from the Annual Report of the Secretary of the Interior, for the fiscal year ended June 30, 1961.) Summarizes the various activities of the Bureau of Commercial Fisheries; biological research on salmon, tuna, sea lamprey in the Great Lakes, radiation of seafood, fish meals, fishing gear, and economic trends within the fishing industry; and construction of new laboratories and research vessels. Also covers marketing reports and statistics; foreign trade activities, including tariff negotiations and fish meal promotion; the Columbia River Fishery Program; and the Pribilof Islands fur-seal resource. Activities of the Bureau of Sport Fisheries and Wildlife include, among others, a marine game-fish research program, Federal aid in sport-fish restoration, fishery management activities, river basin studies, and a national fish hatchery program.

Report of the Bureau of Commercial Fisheries for the Calendar Year 1957, 78 pp., printed, 1962. This is the first report of the Bureau of Commercial Fisheries, established in 1956. This, however, is not the first annual Government report on fishery activities, for the U.S. Commissioner of Fish and Fisheries issued an annual report to Congress for the year 1872-73. The U.S. Bureau of Fisheries continued the reporting through 1940, after which fishery activities were described annually by the Secretary of the Interior in his departmental report to the President. The present fishery report renews the original series and presents a condensed record of the administrative actions of the Bureau. After background material is given, the report discusses the budget and physical property for the fiscal year 1957; conditions, trends, and developments in both domestic and international fisheries; principal accomplishments of the Bureau in the North Pacific, California, Gulf of Mexico, Atlantic coast, and the Great Lakes; and new programs, meetings, and cooperative efforts in fishery matters undertaken by the Bureau. The appendix includes the Fish and Wildlife Act of 1956, an organization chart of the Bureau, the budget for FY 1957, a list of laws relating to the U.S. commercial fishery, a 1957 list of publications by Bureau personnel, and other data.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Number	Title
MNL- 8	- Portugal's Fishing Industry, 1961, 22 pp.
MNL-32	- Venezuelan Commercial Catch, Production of Processed Fishery Products and Foreign Trade, 14 pp.
MNL-54	- Fisheries in Singapore and British Borneo, 3 pp.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

Annual Report of the Biological Laboratory, Woods Hole, Mass. (for the Year Ending June 30, 1961), Circular 137, 92 pp., illus., processed, February 1, 1962. (Bureau of Commercial Fisheries, Biological Laboratory, Woods Hole, Mass.) Presents a summary of the laboratory's research activities in the Northwest Atlantic Fishery Investigations program. Studies relating to the management of the

groundfish of the Northwest Atlantic, as in past years, continued to occupy an important place in the program. Recommendations limiting the size of net meshes in the various subareas were made by the International Commission for the Northwest Atlantic Fisheries to member countries. The conservation of sea scallops was given considerable attention this year. The highlight of the year was the completion and occupation of the aquarium building. The report also outlines investigations on haddock, ocean perch, cod, hake, flounder, groundfish ecology, benthic ecology, plankton, fish behavior, and larval fish feeding. Also contains reports on biometrics, tagging, shellfish research, and instrumentation studies. Recent publications are also listed and statistical data are given concerning the Laboratory's library.

(Baltimore) Monthly Summary--Fishery Products, July 1962, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore 2, Md.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, July 1962, 17 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tuna-like fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; for the month indicated.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, July 1962, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the month indicated.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, July and August 1962, 8 and 9 pp., respectively (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; and sponge sales; for the months indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, August 1962, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, August 1962, 9 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle 4, Wash.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl receipts reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--May 1962, 21 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

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"A Comparison of Rearing Methods for Channel Catfish Fingerlings," by J. R. Snow, article, Progressive Fish-Culturist, vol. 24, no. 3, July 1962, pp. 112-118, processed, 25 cents.

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Regulations of the Alaska Board of Fish and Game for Commercial Fishing in Alaska, 124 pp., printed. Alaska Department of Fish and Game, 229 Alaska Office Bldg., Juneau, Alaska, 1962. Contains license fees and statutes, definitions of terms used in the regulations, and provisions for commercial fishing in Alaska and in international waters. The general provisions section discusses regulations such as license requirements for fishermen, vessels, and gear; reports required from operators; inspection of fishery establishments; prohibition of explosives, chemicals, and poisons. Also discusses salmon, bottomfish, smelt, herring, shellfish, whitefish, sheefish, and char fisheries requirements; subsistence fishery provisions; and emergency regulations.

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"Spratelloides delicatus (Bennet) as a Potential Live Bait for Tuna in the Laccadives," by S. Jones, article, *Journal of the Marine Biological Association of India*, vol. 2, no. 1, 1960, pp. 103-104, illus., printed. Marine Biological Association, Marine Fisheries Post Office, Mandapam Camp, South India.

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"Opyt Primeneniya Tekhnicheskikh Sredstv Izucheniya Raspredeleniya i Povedeniya Promyslovykh Ryb" (An Experiment in Applying Technical Means for Studying the Distribution and Behavior of Commercial Fishes), by O. N. Kiselev, article, *Trudy Soveshchaniia, Ikhthiol. Komissii Akad. Nauk SSSR*, vol. 10, 1960, pp. 235-238, printed in Russian. Four Continent Book Corp., 156 5th Ave., New York 10, N. Y.

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The Establishment of a National Program of Fisheries Research, by C. R. Idyll, Contribution No. 271, 5 pp., printed. (Reprinted from *Indo-Pacific Fisheries Council*, 9th Proceedings, section III, 1961, pp. 17-21.) Marine Laboratory, University of Miami, #1 Rickenbacker Causeway, Miami 49, Fla.

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"Natural Resources of the Sea," by Louis S. Kornicker, article, *Naval Research Reviews*, June 1961, pp. 1-9, illus., printed. Office of Naval Research, Department of the Navy, Washington 25, D. C. A brief review of the sea's natural resources and the part the Navy plays in the development of the marine sciences in the United States. The author discusses the development and acquisition of new and improved research instruments, devices, and techniques for oceanographic research. Resources of the sea are also discussed.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

The World Biomass of Marine Fishes (Paper read at FAO International Conference on Fish in Nutrition, Washington D. C., 19-27 September 1961), by H. W. Graham and R. L. Edwards, 6 pp., illus., processed in English with French and Spanish abstracts. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1961.

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Fish Farming Methods in the Philippines, Indonesia, and Hong Kong, by T. Gottfried Pillai, FAO Fisheries Biology Technical Paper No. 18, 74 pp., illus., processed, limited distribution. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, March 1962. This report is the result of a 25-week study tour on a fellowship granted by the Food and Agriculture Organization of the United Nations. The methods of brackish-water and fresh-water fish farming, as practiced in the Philippines, Indonesia and Hong Kong are discussed. Covers the culture of milkfish, shrimp, siganid, oyster and *Mytilus*, grey mullet, rice-cum-fish, and fresh-water species. The material is arranged and presented as a guide, and may also serve as a basis for the classification and accumulation of data on fish-farming methods.

"**Fish Hatcheries and Farms Flourishing**," article, Japan Report, vol. 7, November 15, 1961, p. 10, printed. Information Office, Consulate General of Japan, 253 E. 42nd St., New York 17, N. Y.

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Fish Flour--Technological Developments in the United States of America (Paper read at the FAO Interna-

tional Conference on Fish in Nutrition, Washington, D. C., 19-27 September 1961), by E. R. Pariser, 11 pp., processed in English with French and Spanish abstracts. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1961.

FISH MEAL:

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"**Fish Meal Does Not Flavor Beef**," article, *Feedstuffs*, vol. 33, September 23, 1961, p. 75, printed. Feedstuffs, Miller Publishing Co., 2501 Wayzata Blvd., Minneapolis 5, Minn.

"**Fish Meal Growth Factor Remains Potent in Storage**," article, *Feedstuffs*, vol. 34, February 17, 1962, p. 24, printed. Feedstuffs, Miller Publishing Co., 2501 Wayzata Blvd., Minneapolis 5, Minn.

"**The Nutrition of the Early-Weaned Calf. II--A Comparison of Commercial Peanut Meal, Heat-Treated Peanut Meal, and Fish Meal as the Major Protein Source in the Diet**," by F. G. Whitelaw, T. R. Preston, and G. S. Dawson, *Chemical Abstracts*, vol. 55, October 16, 1961, 21297a, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C.

"**The Value of Menhaden Fish Meal in Practical Broiler Diets**," by R. H. Harms, P. W. Waldroup, and C. R. Douglas, article, *Poultry Science*, vol. 40, November 1961, pp. 1617-1622, printed. Poultry Science Association, Ohio State University, Columbus 10, Ohio.

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"**Nutritive Element of Fish Meal and Solubles Produced in Various Countries**," by Shigeo Murayama and Masaaki Yanase, *Chemical Abstracts*, vol. 55, May 1, 1961, 8691c, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C.

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"**A Method of Estimating Mortality Rates From Change in Composition**," by Robert H. Lander, article, *Journal of the Fisheries Research Board of Canada*, vol. 19, no. 1, January 1962, pp. 159-168, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

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"**The Specific Heat and Thermal Conductivity of Fish Muscle**," by A. C. Jason and R. A. K. Long, article, *Proceedings of the Ninth International Congress on Refrigeration*, Paris, 1955, pp. 2, 160-162, 169, printed. Comité du IXe Congrès International du Froid, 177 Blvd. Malesherbes, Paris 17e, France.

"**Water Retention of Fish Muscle Paste. II--Effect of pH on the Water-Holding Capacity**," by Yutaka Shimizu, Iiso Fujita, and Wataru Simidu, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 26, July 1960, pp. 749-752, printed. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

FISH OILS:

"**Preparation of a Coating Material by Chlorination of Fish Oil. X--Change in Melting Point of a Chlorina-**

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tion Product Caused by Irradiation with γ -Rays; XI--Fire-Retardant Effect of a Chlorination Product of Fish Oil on Coating Materials Mixed Therewith; XII--Temperature during Combustion of a Wooden Plate Painted with a Coating Material Containing a Chlorination Product of Fish Oil," by Kotsaku Suzuki, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 27, June 1961, pp. 578-585; and July 1961, pp. 673-677, printed in Japanese. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

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"On the Yellowtail Oil. III--On the Compound Lipids in Liver," by Hideo Tsuyuki and Uhei Naruse, article, *Journal of Japan Oil Chemists' Society*, vol. 10, no. 8, 1961, pp. 474-479, printed. Japan Oil Chemist's Society, Department of Applied Chemistry, Faculty of Engineering, University of Tokyo, Moto-fujicho, Bunkyo-ku, Tokyo, Japan.

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"Preserves Made of Marine Byproducts," by K. A. Barabianov, article, *Rybnoe Khoziaistvo*, vol. 35, 1959, pp. 57-61, printed in Russian. VNIRO Glavniproekt, pri Gosplanie SSSR, Moscow, U.S.S.R.

FISH PROCESSING:

Research in Connection with Processing of Fish on Board (Paper read at Visserij Congres, Scheveningen, Netherlands, 31 May-2 June 1961), by J. van Mameren, printed. Institute for Fishery Products, Haringkade 1, IJmuiden, Netherlands, 1961.

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"Results of Sampling the Fish Population of an 88-Acre Pond by Electrical, Chemical, and Mechanical Methods," by Albert E. Sanderson, Jr., article, *Proceedings of the Fourteenth Annual Conference, Southeastern Association of Game and Fish Commissioners*, pp. 185-198, printed. Southeastern Association of Game and Fish Commissioners, Columbia, S. C., 1960.

"Toward a Safe and Effective Method of Using Dynamite to Sample Fish Populations and Determine Species Range in Large Rivers," by Robert C. Averett and Robert M. Stubbs, article, *Journal of the Tennessee Academy of Science*, vol. 37, no. 1, 1962, pp. 20-22, printed. Secretary, Tennessee Academy of Science, Belmont College, Nashville, Tenn.

FISH SCHOOLING:

"The Development of Schooling in Fishes. II," by Evelyn Shaw, article, *Physiological Zoology*, vol. 34, no. 4, 1961, pp. 263-272, printed. University of Chicago Press, 5750 Ellis Ave., Chicago 37, Ill.

FISH SOLUBLES:

"Isolation and Nature of an Unidentified Growth Factor(s) in Condensed Fish Solubles," by Michael E.

Mason, Jacob Sacks, and E. L. Stephenson, article, *Journal of Nutrition*, vol. 75, November 1961, pp. 253-264, printed. American Institute of Nutrition, 36th St. at Spruce, Philadelphia 4, Pa.

FISH SPOILAGE:

"The *Pseudomonas* and *Achromobacter* Groups of Bacteria in the Spoilage of Marine Whitefish," by J. M. Shewan, G. Hobbs, and W. Hodgkiss, article, *Journal of Applied Bacteriology*, vol. 23, no. 3, 1960, pp. 463-468, printed. Wallace and Tierman Ltd., Power Rd., London W4, England.

FISH STORAGE:

"Changes in Histological Texture and Additional Freezing Out of Water in Fish Tissue During Storage," by A. I. Piskarev and A. K. Kaminarskaya, article, *Kholodil'naya Tekhnika*, no. 2, 1962, pp. 34-38, illus., printed in Russian. Kholodil'naya Tekhnika, Four Continent Book Corp., 822 Broadway, New York 3, N. Y.

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"Evaluation of a Wire Fish Trap as a Commercial Fishing Device in Large Impoundments," by A. Leon Kirkland, article, *Proceedings of the Fourteenth Annual Conference, Southeastern Association of Game and Fish Commissioners*, pp. 199-215, printed. Southeastern Association of Game and Fish Commissioners, Columbia, S. C., 1960.

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"A Report on the Operation of a Fishway on Lake Bistineau, La.," by Donald W. Geagan and Harry E. Schafer, article, *Proceedings of the Fourteenth Annual Conference, Southeastern Association of Game and Fish Commissioners*, pp. 222-225, printed. Southeastern Association of Game and Fish Commissioners, Columbia, S. C., 1960.

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FOOD ADDITIVES:

"Food Additives: A Reference Guide," article, *Frosted Food Field*, vol. 33, December 1961, pp. 13-14, 16-19, printed. Frosted Food Field, Inc., 321 Broadway, New York 7, N. Y.

FOOD AND AGRICULTURE ORGANIZATION:

Current Bibliography for Aquatic Sciences and Fisheries--Taxonomic Classification, FAO Fisheries Biology Technical Paper No. 12, 90 pp., processed in English, French, and Spanish, limited distribution.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, December 1961. This paper contains a list, in alphabetical order, of generic names occurring in the taxonomic indexes of the Current Bibliography for Aquatic Sciences and Fisheries up to and including volume 5.

FAO Catalogue of Fisheries Publications and Documents, May 1948-1962 (Provisional edition), compiled by Patricia M. Andrews, 56 pp., processed in English, French, and Spanish. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1962. Replaces the previous edition of June 1961. Lists publications and documents issued by FAO, such as FAO Fisheries Papers, FAO Fisheries Study series, and Meeting and Survey Reports; and publications of the Indo-Pacific Fisheries Council, General Fisheries Council for the Mediterranean, European Inland Fisheries Advisory Commission, and Regional Fisheries Commission for Western Africa. Also lists publications issued by permission of FAO and reprints of documents or articles not published by but available from FAO.

The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Technical Assistance Program for developing the fisheries of many countries. These reports have not been published on a sales basis, but have been processed only for limited distribution to governments, libraries, and universities. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Rapport au Gouvernement de la Yougoslavie sur L'osticulture et la Mytiliculture (Report to the Government of Yugoslavia on Oyster Culture and Mussel Culture), by Pierre E. Lubet, FAO Report No. 1334, 77 pp., processed in French, 1961.

Report on the Training Centre for Master Fishermen Conducted by the United Arab Republic and the Food and Agriculture Organization of the United Nations at Suez (September 1-October 1960), by P. A. Lusyne, FAO Report No. 1345, 27 pp., illus., processed, 1961.

Rapporto al Governo della Jugoslavia sulla Pesca Marittima (Report to the Government of Yugoslavia on the Marine Fisheries), by Luigi Fausto Farina, FAO Report No. 1367, 23 pp., illus., processed in Italian, 1961.

General Fisheries Council for the Mediterranean, Proceedings and Technical Papers, no. 6, 482 pp., illus., printed in French and English. General Fisheries Council for the Mediterranean, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1961. Part I contains a list of the participants and a summary record of the plenary sessions of the sixth session of the GFCM, Rome, September 22-28, 1960. Included is a report of the work programs and recommendations and resolutions of the marine resources, production, utilization, inland waters, and economics and statistics committees. Part II consists of the texts of the technical papers presented in addition to lists of the papers in numerical order and in alphabetical order of authors.

FREEZE-DRYING:

"Freeze-Drying of Foodstuffs," by G. W. Oetjen, article, Journal of Refrigeration, vol. 4, no. 1, 1961, pp. 10-12, illus., printed. Foxlow Publications Ltd., 19 Harcourt St., London W1, England.

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FREEZER-TRAWLER:

"New Freezer-Trawler Zephyros IV," article, Alieia, vol. 16, no. 182, 1962, pp. 59-61, illus., printed in Greek. Alieia, 51 Stadium St., Athens, Greece.

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"Freezing Crabs Afloat," by C. V. Tench, article, Food Manufacture, vol. 36, December 1961, pp. 517-519, printed. Food Manufacture, Leonard Hill, Ltd., Stratford House, 9 Eden St., London NW1, England.

"New Developments in Quick-Freezing," by Graham Kemp, article, Food Manufacture, vol. 36, August 1961, pp. 339-342, printed. Food Manufacture, Leonard Hill Ltd., Stratford House, 9 Eden St., London NW1, England.

"Present Freezing Techniques for Fish," by A. Benezit, article, La Peche Maritime, vol. 40, no. 999, June 1961, pp. 371-381, illus., printed in French. La Peche Maritime, 190 Blvd. Haussmann, Paris, France.

Quality Changes in Fish on Freezing, by A. I. Piskarev, Governmental Publication of Books for Trade Requirements, 40 pp., illus., printed in Russian. Four Continent Book Corp., 156 5th Ave., New York 10, N. Y., 1960.

"Ueber das Gefrieren von Seefischen" (On the Freezing of Marine Fish), by J. Gutschmidt, article, Kaelte-technik, vol. 13, no. 6, 1961, pp. 216-225, illus., printed in German. Verlag C. F. Muller, Karlsruhe, Germany.

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"Electronics and Freshwater Biology," by W. H. Moore, article, British Communications and Electronics, vol. 7, no. 1, 1960, pp. 20-23, printed. Heywood and Co., Ltd., Drury House, Russell St., London WC2, England.

FRESH-WATER FISH:

"Poissons d'Eau Douce," (Fresh-Water Fishes), by Charles Jacques Spillman, Biological Abstracts, vol. 37, no. 3, 1962, 12128, printed. University of Pennsylvania, 38-5 Walnut St., Philadelphia 4, Pa.

FRESH-WATER IMPOUNDMENTS:

"Effect of Mixing Depth and Turbidity on the Productivity of Fresh-Water Impoundments," by Garth I. Murphy, article, Transactions of the American Fisheries Society, vol. 91, no. 1, 1962, pp. 69-76, printed. Secretary, American Fisheries Society, P. O. Box 483, McLean, Va.

FROZEN FISH:

"Air-Thawing of Sea-Frozen Fish; Dielectric Thawing of Herring and Sea-Frozen Fish," article, Torry Research Station Annual Report, 1960, pp. 21-22, printed. Torry Research Station, Aberdeen, Scotland, 1961.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"Quality of Sea-Frozen Fish," article, Torry Research Station Annual Report, 1960, pp. 17-18, printed. Torry Research Station, Aberdeen, Scotland, 1961.

GEAR:

An Approximate Method for Estimating Trajectories of Cable-Towed Vehicles, by Douglas A. King, IAS Paper No. 62-56, 11 pp., illus., processed, \$1. Institute of the Aerospace Sciences, 2 E. 64th St., New York 21, N. Y., 1962. According to the author, "Adequate relationships exist for predicting such steady-state performance characteristics of cable-towed underwater vehicles as running depth, towing force, and effects of vehicle and cable parameters. The time required to go from one depth to another, ability to follow a sloping sea bottom, and other dynamic performance characteristics are more difficult to predict, primarily because of the dynamic forces on the tow cable." After a brief review of the basic forces acting, there is described a method for calculating the changes in cable forces brought about by descending or ascending velocities of the towed vehicle. Examples are given of dynamic performance characteristics of a hypothetical cable-towed vehicle. It is shown that space trajectories of a winged cable-towed vehicle are essentially independent of towing speed. The method presented is based on some simplifying assumptions regarding the cable shape and the distribution of vertical velocity along the cable. Tests indicate satisfactory prediction of dynamic behavior up to moderately large ratios of running depth to cable length.

"On the Nature of the Selective Fishing Action of Long-line Gear," by Vernon E. Brock, article, Pacific Science, vol. 16, no. 1, 1962, pp. 3-14, printed. Office of Publications, University of Hawaii, Honolulu, Hawaii.

GENERAL:

"Urban Family Expenditures for Fish 1953, 1955 and 1957," by H. C. Frick, article, Trade News, vol. 13, March 1961, pp. 5-18, processed. Information and Educational Service, Department of Fisheries, Ottawa, Canada.

GENERAL AGREEMENT ON TARIFFS AND TRADE: General Agreement on Tariffs and Trade, Analysis of United States Negotiations, 1960-61 Tariff Conference, Geneva, Switzerland, Department of State Publication 7408, Commercial Policy Series 194, 154 pp., processed, 45 cents. U. S. Department of State, Washington, D. C., July 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)

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Berichte der Deutschen Wissenschaftlichen Kommission für Meeresforschung (Transactions of the German Scientific Committee for Sea Research), Neue Folge, Band XVI, Heft 3, 1962, 89 pp., illus., printed in German. E. Schweizerbart'sche Verlagsbuchhandlung (Nägele u. Obermiller), Stuttgart, W. Germany. Contains the following articles: "Vergleichende Untersuchungen an Otolithen von Jungheringen der Nordsee im Frühjahr 1960" (Comparative Studies of the Otoliths of Small Herring of the North Sea Conducted in the Spring of 1960), by Eva Bohl; and "Biologisch-Statistische Untersuchungen über

die Deutsche Hochseefischerei. IV--Die Entwicklung der Hochseefischerei in Fangtechnischer, Raumlicher und Biologischer Hinsicht. 5--Die Dampferfischerei in der Nordsee" (Biological-Statistical Studies of the German High Sea Fisheries. IV--The Development of the High Sea Fisheries in View of Catching Technique, Capacity, and Biological Considerations. 5--Steamship Fishing in the North Sea), by Johannes Lundbeck.

"The New Fish-Market at Cuxhaven," article, Peche Maritime, Fr. No. 993, December 1960, pp. 779-803, printed. Peche Maritime, 190, Boulevard Haussman, Paris, France.

GILL NETS:

"The Selection Characteristics of Nylon Gillnets for Tilapia esculenta Graham," by D. J. Garrod, article, Journal du Conseil, vol. 26, 1961, pp. 191-203, illus., printed. Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund-Slot, Denmark.

"The Selection of Clarias mossambicus (Peters) by Nylon Gillnets," by J. A. Gulland and D. Harding, article, Journal du Conseil, vol. 26, 1961, pp. 215-222, illus., printed. Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund-Slot, Denmark.

HADDOCK:

"Torsken och dess vandringsvanor i Östersjön" (The Migrating Habits of Haddock in the Baltic Sea), by Gunnar Otterlin, article, Svenska Västkustfiskären, vol. 32, no. 6, March 25, 1962, pp. 124-129, illus., printed in Swedish. Svenska Västkustfiskarnas Centralforbun, Göteborg, Sweden.

HALIBUT:

"Browning of Frozen Halibut," article, Torry Research Station, Annual Report 1960, pp. 16-17, printed. Torry Research Station, Aberdeen, Scotland, 1961.

The Exploitation, Scientific Investigation and Management of Halibut (HIPPOGLOSSUS STENOLEPIS Schmidt) Stocks on the Pacific Coast of North America in Relation to the Abstention Provisions of the North Pacific Fisheries Convention, International North Pacific Fisheries Commission Bulletin No. 7, 97 pp., illus., printed. International North Pacific Fisheries Commission, 6640 NW Marine Dr., Vancouver 8, B. C., Canada, 1962. Under the provision of the International Convention for the High Seas Fisheries of the North Pacific Ocean, Japan agrees to abstain from fishing halibut in the Convention area off the coasts of Canada and the United States in which commercial fishing for halibut is being or can be prosecuted. The halibut referred to are defined as those originating along the coast of North America. The purpose of the papers contained in this bulletin was to provide information which would aid the Commission to determine annually, beginning in 1958, whether the halibut stocks in question continued to meet the requirements for abstention given in the Convention. They were submitted to the Commission between 1956 and 1960 by representatives of the Governments of Canada, Japan, and the United States.

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HERRING:

Biological Differences and Similarities Between the White Sea Herring and the Baltic Herring, by N. A. Dmitriev, OTS 61-31039, 9 pp., printed, 50 cents. (Translated from Trudy Vsesoyuznogo nauchno-issledovatel'skogo instituta morskogo rybnogo khozyaistva i okeanografii, vol. 34, 1958, pp. 178-184.) Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., 1962.

"Canada: Catching Winter Herring," article, New Scientist, vol. 12, November 9, 1961, p. 362, printed. New Scientist, Harrison, Raison and Co. Ltd., Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

"Chemical Studies on the Herring (*Clupea harengus*). VI--Carbonyl Compounds Formed During the Heat Processing of Herring," by R. B. Hughes, article, Journal of the Science of Food and Agriculture, vol. 12, December 1961, pp. 822-826, printed. Journal of the Science of Food and Agriculture, Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

"Decline of British Herring Fisheries in the North Sea," by B. B. Parrish, article, Fishing News International, vol. 1, January 1962, pp. 42-45, printed. Fishing News International, A. J. Heighway Publications, Ltd., Ludgate House, 110 Fleet St., London EC4, England.

"Inhibition of the Denaturation by Salt of Myosin in Baltic Herring," by R. R. Linko and O. E. Nikkila, article, Journal of Food Science, vol. 26, November-December 1961, pp. 606-610, printed. Institute of Food Technologists, 510-522 No. Hickory St., Champaign, Ill.

ICED FISH:

"Improvement in Quality of Iced Fish: Fish Hold Design on Trawlers," article, Annual Report, Torry Research Station, 1960, p. 10, printed. Torry Research Station, Aberdeen, Scotland, 1961.

INTERNATIONAL COMMISSIONS:

(International Pacific Salmon Fisheries Commission) Annual Report, 1961, 43 pp., illus., printed. International Pacific Salmon Fisheries Commission, P. O. Box 1120, New Westminster, B. C., Canada, 1962. Discusses commission meetings held during 1961; 1961 regulations, recommendations for regulations, and emergency amendments governing salmon fisheries in Canada and the United States; fishery, escapement, and rehabilitation of sockeye salmon; and a report on pink salmon. Discusses also results of general research activities throughout the year as well as watershed protection. Includes statistical data on sockeye and pink salmon catch by gear; cyclic landings and packs of sockeye from convention waters; daily catch of sockeye and pinks; escapement of sockeye and pinks to the Fraser River spawning areas; and related data.

"International Whaling Commission Fourteenth Annual Meeting," article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 51, no. 7, July 1962, pp. 291-293, printed. Hvalfangsforeningen, Sandefjord, Norway. An account of the Fourteenth Meeting

of the International Whaling Commission in London, July 2-6, 1962. Included are discussions of the 1961/62 Antarctic whaling season results, actions taken during the meeting, and financial operations of the Commission. The catch of blue whales will once more be limited to 15,000 units during the 1962/63 season. The length of the open season for Antarctic pelagic whaling will again be from December 12 to April 7.

JAPAN:

Bulletin of the Faculty of Fisheries, Nagasaki University, No. 12, 84 pp., illus., printed in Japanese with English summaries. Faculty of Fisheries, Nagasaki University, Sasebo, Japan, March 1962. Includes, among others, the following articles: "Studies on the Fluctuation in Catch of the Tuna-Fishing Fleet. X--Variability of Hooked--Rates for Tunas and Marlin in the Western South Pacific Ocean during Four Months from August to November 1960," by Shigezuki Koga; "Studies on the Decree of Fishery-Ground in Meiji," by Shigeshi Aotuka; and "On the Decrease of Hematocrit Value of Fish by the Extraction of Blood," by Osamu Tamura, Tetsuo Fujiki and Kuniomi Eto.

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Holm, article, *Norsk Hvalfangst-Tidende* (The Norwegian Whaling Gazette), vol. 51, no. 6, June 1962, pp. 225-240, 242, 244, 246, 249, illus., printed in Norwegian and English. Hvalfangsforeningen, Sandefjord, Norway. Discusses prices, production, and participation in the Norwegian small whale fisheries during the periods 1938-1947, 1948-1953, and 1954-1960. In 1949 concessions were granted to 384 whalers and the production of whale meat became so large that steps had to be taken to restrict the number of concessions. The number of concessions issued was gradually reduced and stabilized at about 200 per annum since 1954. The whaling season was restricted to 6 months a year beginning in 1952. In 1955, regulations provided that the taking of small whales in waters north of 70° N. latitude should terminate June 30. Since the shore stations' production declined after 1952, the small-whale fishermen have increased their whaling intensity, so that the average annual production of

the two combined has remained at about 6,400 tons of whale meat. The wholesale price of little piked whale meat had a regulative influence on the total production of whale meat between 1949 and 1957. Since 1958 the wholesale prices have risen unusually high, while the production has been below the average.

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FISH CURING ON NORTH AMERICAN NORTH ATLANTIC COAST DATES BACK TO 1500

"The fish-curing industry of the North Atlantic coast of North America dates back at least to the year 1500. There are authentic records of fish-curing activities as of that period, and legends of activities at much earlier date. An extensive fish-curing industry along the North Atlantic coast of North America was carried on for more than one hundred years before there was any permanent settlement. As early as the year 1580 more than 300 ships from Europe were salting cod in this area. Newfoundland, 'the oldest British colony,' owes its origin to the fish-curing industry which is still the dominant factor in the economic life of that country."

*--Principles and Methods in the Canning of Fishery Products,
Research Report No. 18 (page 2),
U. S. Fish and Wildlife Service*

Editorial Assistant--Ruth V. Keefe

Compositors--Jean Zalevsky, Alma Greene, Helen Paretti, and Raie Carron

* * * * *

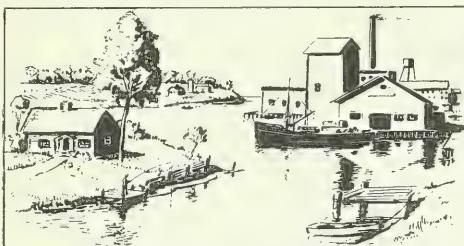
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Cover, pp. 12, 13, 14, & 15--A. C. Jensen, Woods Hole, Mass.; p. 17--V. L. Fortin, Juneau, Alaska; pp. 28, 29, 42, & 52--F. B. Sanford and C. F. Lee; p. 37--Coast and Geodetic Survey; p. 48--New Bedford Standard Times; p. 64, fig. 2--Royal Danish Ministry of Foreign Affairs; p. 78--Consulate General of Japan, N. Y.

INDUSTRIAL FISHERY PRODUCTS - 1961

C. F. S. 2863, Industrial Fishery Products - 1961 (An Annual Summary), shows the production of industrial fishery products by 170 plants in the United States, American Samoa, and Puerto Rico in 1961 was valued at \$74.5 million to the processors.

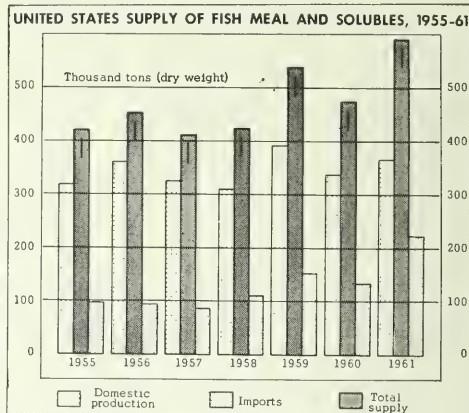
The 1961 production of fish scrap and meal amounted to 311,000 tons valued at \$32 million to the processors. This was 21,000 tons more than in 1960 and exceeded the previous record established in 1959 by nearly 5,000 tons. Menhaden meal accounted for 80 percent of the total production of fish meal.



Production of fish and fish-liver oils in the United States and Puerto Rico totaled nearly 35 million gallons. The production was 23 percent above that of 1960 but below the record 40 million gallons produced in 1936. Menhaden oil established a new record and accounted for 91 percent of the 1961 production.

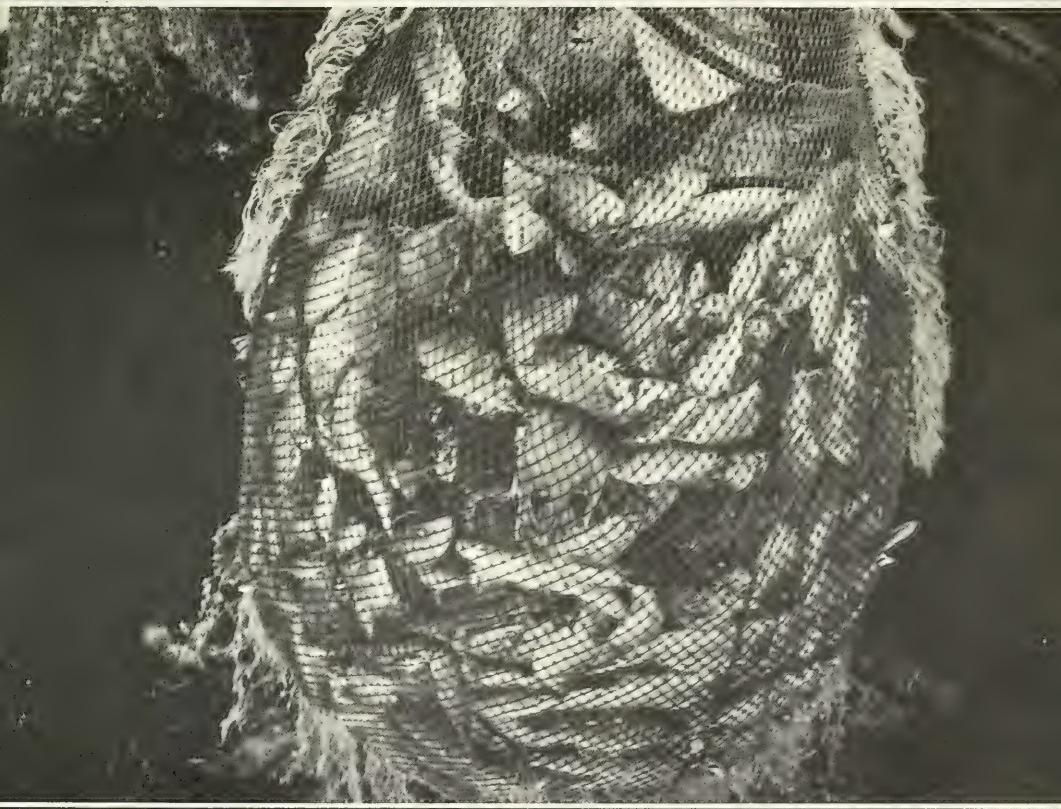
The yield, during 1961, of homogenized condensed fish (nearly 12,000 tons) was about 2,000 tons above that of the previous year. Production of fish solubles (100,000 tons) was about 10,000 tons larger than in 1960.

Copies of C. F. S. No. 2863 are available free from the Office of Information, U.S. Fish and Wildlife Service, Washington 25, D. C.



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Fishes

COMMERCIAL FISHERIES REVIEW



VOL. 24, NO. 12

DECEMBER 1962

FISH and WILDLIFE SERVICE
United States Department of the Interior
Washington, D.C.



COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor

Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

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Use of funds for printing this publication has been approved by the Director of the Bureau of the Budget, May 10, 1960.

5/31/63

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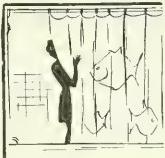
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ORIGIN OF MAINE SARDINE CANNING INDUSTRY

"Sardines were first packed at Nantes, France, in 1834, and by 1860 a fairly good market had been created for French sardines in this country. Efforts were made to establish an American industry in 1871, utilizing young menhaden as raw material. In 1877 Julius Wolff began canning small herring at Eastport, Me., and is credited with starting the first really successful American sardine cannery. In a few years a large number of sardine canners were operating in northern Maine and nearby Canada."

--"Principles and Methods in the Canning of Fishery Products,"
Research Report No. 7 (page 3),
U. S. Fish and Wildlife Service.

Editorial Assistant--Ruth V. Keefe

Compositors--Jean Zalevsky, Alma Greene, Helen Paretti, and Raie Carron

* * * * *

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COMMERCIAL FISHERIES REVIEW

December 1962

Washington 25, D. C.

Vol. 24, No. 12

SNAPPER TRAWLING EXPLORATIONS ALONG THE SOUTHEASTERN COAST OF THE UNITED STATES

By Robert Cummins, Jr.,* Joaquim B. Rivers,* and Paul Struhsaker*

SUMMARY

Concentrations of food fish along the southeastern coast of the United States have been discovered by U. S. Bureau of Commercial Fisheries exploratory fishing with the chartered trawler Silver Bay. Catches, during the explorations, ranged up to 2,000 pounds of snapper, grouper, and ecologically-related species having average landed values of 15 to 23 cents a pound. Best catches were made on "live bottom" off St. Augustine, Fla., and SSE. of Cape Fear, off the Carolinas. Careful attention to depth-recorder fish traces and use of a funnel flapper in the roller-rigged trawls were major factors in the success of the explorations.

INTRODUCTION

Exploratory fishing has revealed commercial concentrations of food fish in selected areas along the south Atlantic coast of the United States. Because of the interest shown in this potential fishery, the following report has been prepared to provide preliminary information on trawl-caught snapper, grouper, and ecologically-related species. The information is preliminary in that explorations on a regional and seasonal basis are incomplete. Data obtained on cruises of the trawler Silver Bay, a vessel chartered for fishery explorations by the U. S. Bureau of Commercial Fisheries, form the basis of the report.

AREA OF EXPLORATIONS

Exploratory fishing with roller-rigged fish trawls was conducted over the continental shelf in 15 to 70 fathoms between Ft. Pierce, Fla., and Cape Hatteras, N. C. Most coverage was obtained in 15 to 30 fathoms where the bottom varied from smooth to broken, but where trawling with roller-rigged trawls was generally possible. Limited coverage was given the 30- to 70-fathom range.

From 15 to 70 fathoms between Cape Lookout and Cape Canaveral, "live bottom" areas were found where food fish were caught with bottom trawls in varying amounts. "Live bottom" is composed, typically, of the following animals and inert materials.

Loggerhead sponge	- generally present, small to very large amounts
Fire sponge	- generally present, variable amounts
Other sponge	- always present, small amounts
Coral	- occasionally present, small amounts
Rock	- sometimes present, variable amounts
Shell	- usually present, small amounts

The area beyond 70 fathoms adjacent to the Gulf Stream was not explored with fish trawls, and the extent of the resources in deep water is, therefore, unknown.

*Fishery Methods and Equipment Specialists, Exploratory Fishing and Gear Research Station, U. S. Bureau of Commercial Fisheries, Brunswick, Ga.

During exploratory fishing trials, the best catches were invariably made on "live bottom" when fish tracings appeared on a whiteline depth-recorder. Characteristically, the catches possessed a strong, warmly pungent odor associated with the "live bottom."

Off St. Augustine, Fla., and SSE. of Cape Fear, S. C., good catches were made consistently on "live bottom" at different seasons during several Silver Bay cruises (fig. 1). Cov-

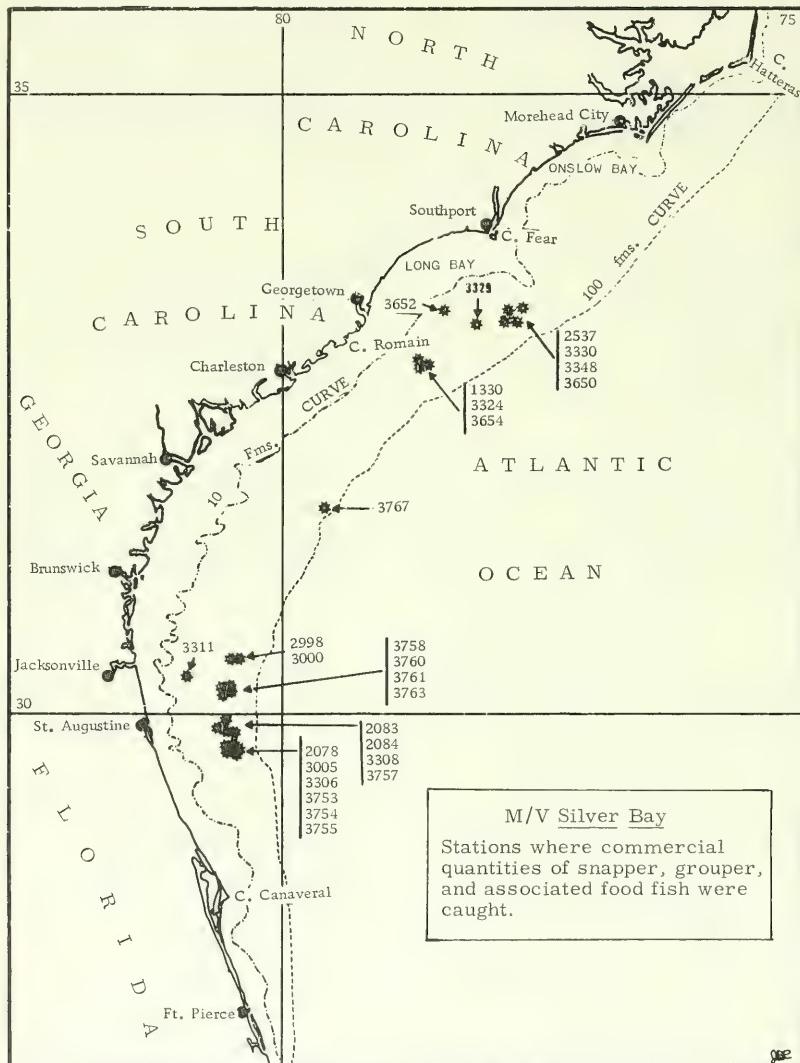


Fig. 1 - Chart of southeastern coastal waters explored for snapper and related food fishes, October 1959-March 1962.

erage by the Silver Bay has not been sufficiently extensive, to date, to delineate in detail "live bottom" areas suitable for bottom trawling.

FISHING RESULTS

FOOD FISH: The species here referred to as snapper, grouper, and ecologically-related food fish, which constituted the most valuable portion of the catches, are listed and grouped in the order of their approximate value in table 1.

Table 1 - Snapper, Grouper, and Ecologically-Related Food Fish Taken Commonly in Silver Bay Trawl Catches

Common Name	Scientific Name
Vermilion snapper	Rhomboptilus aurorubens
Yellowtail snapper	Ocyurus chrysurus
Red snapper	Lutjanus blackfordii
Mutton snapper	Lutjanus analis
Gray snapper	Lutjanus griseus
Silk snapper	Lutjanus vivanus
Hogfish	Lachnolaimus maximus
Black sea bass	Centropristes striatus
Black grouper	Mycteroperca bonaci
Red grouper	Epinephelus morio
Groupers (miscellaneous)	Mycteroperca sp. and Epinephelus sp.
Scamps	Mycteroperca phenax and M. interstitialis
Red porgy	Pagrus sedecim
White porgies	Calamus sp. (2 species taken commonly)
Porgies (miscellaneous)	Stenotomus sp.
Grunts	Haemulon aurolineatum and Haemulon plumieri
Triggerfish	Balistes capricrus

Note: Listed in order of apparent local commercial potential.

VERMILION SNAPPER: This fish was found throughout the area and is the most valuable species taken in commercial quantities.

Silver Bay trawling resulted in salable catches of up to 1,000 pounds per drag, and the fish were sold for as high as 35 cents a pound. Some catches contained many small individuals, but for the most part, the average size was about 2 pounds. Like red snapper, vermillion snapper are bright red in color, and the meat is light and mild. They normally demand a higher price than red snapper on the East coast. The fish are easily captured in fish trawls, but the use of a "funnel flapper" (fig. 2) is recommended to prevent their escapement.

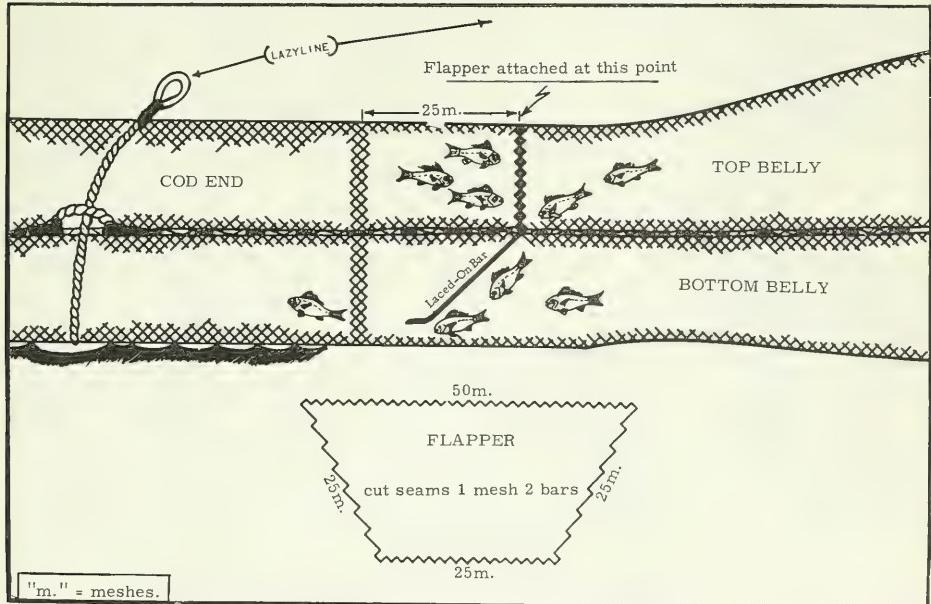


Fig. 2 - Cutting diagram and detail of arrangement of the funnel flapper. The flapper helps prevent fish from swimming out of the trawl.

OTHER SNAPPER: Other species of snapper, and hogfish, were usually present. A greater number of species per drag was present off Florida than farther north. Seldom did a drag produce more than about 200 pounds of a single snapper other than vermillion snapper, but collectively, the miscellaneous snappers comprise a group next in value to vermillion snapper.

BLACK SEA BASS: Sea bass were not taken in amounts exceeding 200 pounds per drag. Normally they command a good price, and they are easily handled. With additional coverage of areas and seasons, it is possible that this species will be found in greater quantities.

GROUPER: Numerous catches contained several 30- to 40-pound grouper. Grouper contributed significantly to the catches and were sold for about 10 cents a pound.

ASSOCIATED SPECIES: The remaining food fish were scup or porgy (at least three species), triggerfish, and grunt. The latter were occasionally taken in commercial quantity, but were usually of a size smaller than is normally marketed. They are mentioned here because the size taken is sometimes marketed in quantity in other sections of the Atlantic seaboard.



Fig. 3 - Catch of groupers, porgies, triggerfish, and associated species of food fish aboard the Silver Bay.

Triggerfish were quite common in the catches and ranged in amounts up to about 600 pounds per drag. The species is salable locally and when filleted is marketed as turbot steak.

The three species of scup or porgy often comprised the bulk of salable fish. They are referred to commercially as red porgy, small white porgy, and large white porgy. All brought the same price--about 8 cents a pound--and catches of salable fish ranged up to more than 1,000 pounds per drag.

VALUE: During two cruises, test landings were made to determine the approximate value of the catches. In order to determine an average value, the salable fish were sorted, iced down in the hold,^{1/} landed, and sold in the approximate same proportions as they occurred in the catch. The value per pound was found to average 23 cents in May 1961 (Silver Bay Cruise 30) and 15 cents in February 1962 (Silver Bay Cruise 37).

FISHING METHODS

During initial exploratory fishing trials, routine transects were made over a broad area. Fishing sets were made "in the blind" and at locations when fish tracings occurred on the whiteline depth-recorder. It was found that catches of snapper, grouper, and ecologically-related species were invariably made when fish tracings occurred on and near bottom. From this information the following procedure was developed, which became standard practice on Silver Bay cruises.

With the whiteline recorder on, transects were made in areas likely to contain broken or irregular bottom. When bottom fish tracings were observed, a buoy, maintained "at the ready" was immediately set out to mark the exact location. So long as the recorder was set for the speed of the vessel, transects could be effectively made at any speed. Generally, when wide coverage was desired, as when searching for broken bottom areas, transects were made at full speed. When less coverage and greater detail on the recorder was desired, as when searching for fish tracings over broken bottom areas, transects were made at reduced speed. Once the buoy was set out, the surrounding area was "cartwheeled" or worked out in all directions to determine the location, size, and number of fish concentrations and the bottom contour. Finally, on the basis of recorder tracings of fish and bottom contour, the actual fishing operation was begun.

During earlier cruises, as an aid in determining the size and species being recorded, hand-line fishing over tracings of fish was occasionally performed prior to "shooting" the trawl. With experience, however, fish tracings on and near bottom could be accurately interpreted, as evidenced by the fact that it was possible to make good catches of the sought-after food fish solely on the basis of the recorder tracings.

GEAR USED

The Silver Bay, the gear used in snapper explorations, and the exploratory snapper fishing operation have been described previously (Captiva and Rivers 1960).

A wide variety of gear, including roller-rigged fish trawls varying from 50/70-foot to 86/116-foot and 40-foot industrial fish and shrimp trawls, was used in early explorations. But the principal gear used in most of the explorations was either 50/70 or 80/100-foot roller-rigged trawls with 8- to 10-foot bracket doors. These trawls were hung, rigged, and fished in the usual way (Knake 1956, 1958), except that funnel flappers (fig. 2) similar to those used by some New England fishermen were added. The funnel flappers proved to be useful accessories in preventing the escape of fish from the cod ends. Their use is recommended when the object of trawling is large fish such as snapper and grouper.

^{1/}Snapper (except small vermilion snapper), grouper, scamp, and hogfish were rough dressed prior to icing; all other fish were iced in the round.



Fig. 4 - A fine catch of fish (mostly snappers and groupers) floating in the cod end before pick up by the Silver Bay.



Fig. 5 - Bringing the roller-rigged fish trawl aboard the Silver Bay at the end of a drag. The tree-trunk rollers make possible trawling on broken bottom.

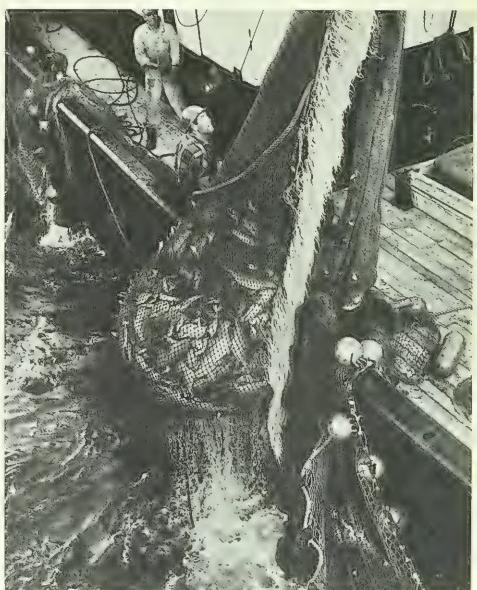


Fig. 6 - Cod end of fish trawl coming aboard the Silver Bay.

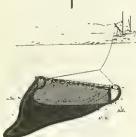
APPENDIX

A detailed fishing log showing fishing positions, gear, minutes fished, and other pertinent data for each drag is available as an appendix to this report. Write for Separate No. 661 which contains Table 2--Fishing Log, Silver Bay Snapper Trawl Stations, 1959-62.

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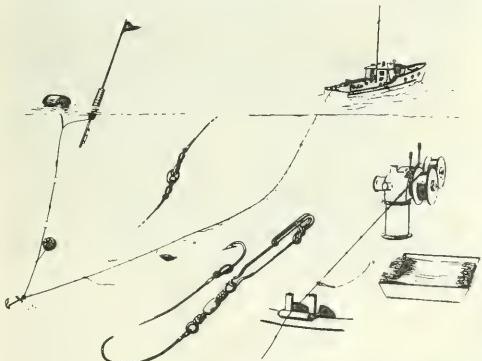
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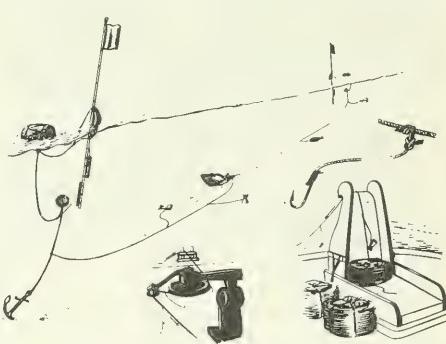


LONGLINE OR SETLINE, WITH HOOKS

This type of gear is an extremely long fishing line with a series of baited hooks on short, separate, but attached, lines. The gear can be anchored or left drifting and requires only periodical attention.



Steel cable longline



Halibut longline

The longline is known as a "trawl line" in New England, a "setline" on the Pacific Coast, and as a "trotline" in the South and inland waters. Although this type of fishing method was once important in the New England fisheries, it has been supplemented during the past twenty years by the otter trawl. However, in the halibut fisheries off the Northwest Coast of the United States this form of fishing continues.

Note: Excerpt from Circular 109, Commercial Fishing Gear of the United States, for sale from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., single copy, 40 cents.

THE UNITED STATES FISHING INDUSTRY AND THE EUROPEAN COMMON MARKET

By Harold E. Crowther* and Arthur M. Sandberg**

INTRODUCTION

The United States fishing industry has important issues at stake in the developing European Economic Community, otherwise known as the Common Market. Gradual application of Community regulations is already having its effect on world trade in fishery products. The full impact of the Common Market is expected by 1970, possibly sooner.

GROWTH BY ECONOMIC UNION

Six countries--France, West Germany, Italy, and the Benelux countries (Belgium, Netherlands, and Luxembourg)--make up the Common Market. Historically, these countries have not seen eye to eye on many problems, including those concerned with trade and tariff matters. Each has operated as an individual nation, separated from its neighbors by trade walls. But changes have occurred in recent years--changes which will affect the world; United States trade will be affected. The six European countries have formed a Common Market, which is essentially a marketing arrangement to remove trade barriers between the member countries and to establish a common external tariff.



Fig. 1 - Six nations have formed an economic union known as the Common Market.



Fig. 2 - Commerce among Common Market countries will flow freely, much as it does in the United States today.

Eventually commerce within the combined area will be carried on freely, much as it is among the States of the United States. There will be no tariffs among the countries making up this customs union, and no restrictions on movement of goods, capital, services, and workers. Like the United States, the Common Market will have a single policy on imports from "outside" countries.

Shortly after World War II, a drive for European unification began as a means of overcoming political and economic problems. In 1947, the United States fostered the Marshall Plan which laid the groundwork for European recovery and cooperation. The Organization

* Assistant Director

** Trade and Tariff Specialist

Note: Adapted from a report ("Problems of the Common Market") delivered at the 21st Annual Meeting of the Atlantic States Marine Fisheries Commission, September 26, 1962.

} U. S. Bureau of Commercial Fisheries, Washington, D. C.

for European Economic Cooperation, set up in 1948, was followed by creation of the Benelux Customs Union. Later came the European Coal and Steel Community, and the European Atomic Energy Community. In March 1957, the Treaty of Rome set up the framework for the Common Market and started Western Europe on a new page in her history.

Many people say that the European Common Market is the most significant economic development of this century. It is only four years old and already astonishingly successful in establishing European unity where total disagreement existed before. From the Marshall Plan onward, the United States has consistently encouraged economic and political cooperation in Western Europe within the framework of a liberal trade policy for it sees in the rise of a unified, prosperous Western Europe a vast increase in the strength of the Free World at a time when strength is urgently needed.

COMMON MARKET BENEFITS

In area, the Common Market is relatively small but its population of 170 millions is close to that of the United States today. Furthermore, the Common Market is one of the most intensively industrialized areas of the world.

There is every indication that the Common Market is succeeding beyond normal expectations; tariffs between member countries have already been cut substantially on many products, and in a few years they will be eliminated entirely. The economic growth rate of the Common Market has been accelerating. Industrial goods are flowing freely and virtually all workers are employed. High purchasing power and availability of goods have stimulated buying, and exports and imports have increased. Other countries in Europe foresee considerable advantages in membership in the Common Market, as well as certain trade problems that they would face if they did not become members.

OTHER COUNTRIES SEEK ENTRY

The leading fishing nations of Western Europe--the United Kingdom, Norway, and Denmark--are now seeking entry into this economic union. The total annual output of fish by those three countries has been 3.2 million metric tons. The Common Market countries produce about 1.9 million tons. Iceland has not sought membership but statements from officials of that country indicate an awareness of possible difficulties, if the United Kingdom, Norway, and Denmark are accepted into the Common Market. In view of its heavy dependence on fisheries, Iceland may seek some type of association that would permit its fishery products free access to the Common Market.

With these additional countries as members, the Common Market would encompass a trading area of about 250 million people--

EEC-U.S. COMPARISON OF SIZE



Fig. 3 - In area, France and West Germany are both smaller than Texas; Belgium is about the size of Maryland; the Netherlands is larger than Massachusetts; and Italy is the size of New Mexico.

COUNTRIES SEEKING MEMBERSHIP



Fig. 4 - Leading fishing nations of Europe now seek entry into Common Market.

larger than the United States. The enlarged Common Market will be the biggest trading area in the world, creating a greater marketing challenge.

Conditions under which new countries would be permitted entry into the Common Market are now being negotiated and we are watching the outcome carefully. The United Kingdom, second only to the United States as an importer of fishery products, is also a leading fish-producing country. As a member of the Common Market, the United Kingdom would accept the Market's tariff system and adopt uniform fishery policies, but in doing so it may abolish preferential tariffs on goods from Canada, New Zealand, and Australia. The Commonwealth countries are concerned that they will lose profitable trade in the United Kingdom market should the United Kingdom enter the Common Market.

The Common Market thus already consists of an important and collectively powerful group of countries and promises to be enlarged even further in the relatively near future. Greece has concluded an agreement for association with the Common Market providing for full economic integration but over a longer period than for the present members. Other countries, such as Sweden, Austria, and Switzerland, are seeking more limited relationships with the Common Market.

COMMON TARIFFS INCREASE SOME RATES

The duties for fishery products entering Common Market countries will change substantially in the next several years. In setting up a single "average" common tariff on imports

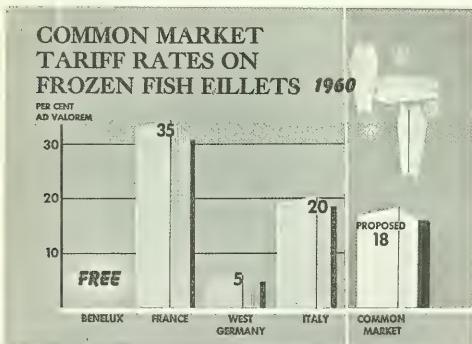


Fig. 5 - In the Common Market, present national duties on fillets will gradually adjust to a uniform level by 1970.

of products from outside the Common Market, it was proposed in 1958 that the new external duties become effective gradually over a period of about 12 years, or by 1970. As an example of the tariff changes resulting from the adoption of a common tariff, let us take the case of fish fillets. The original rate of duty on frozen fish fillets was 5 percent in West Germany, free in the Benelux countries, 35 percent in France, and 20 percent in Italy. The proposed common external tariff of the Common Market is 18 percent ad valorem. Thus, the French and Italian duties will be lowered, but the West German and Benelux rates will be increased. The proposed duty will be substantially higher in the countries that have been importing the bulk of the fish fillets.

On the positive side, however, we might expect the adverse effect of higher duties in

Table 1 - European 1958 National Duties and Eventual Common Market External Tariffs for Certain Fishery Commodities of Interest to United States

Product	Benelux	France	West Germany	Italy	Common External Tariff ¹ /
	(Percent)				
<i>Frozen:</i>					
Fillets	Free	35	5	20	18
Tuna	Free	33	Free	18 (limited duty-free quota)	25 (with limited duty-free quota)
Shrimp	Free	10-30	35	18	18
Salmon	Free	10	3-12	20	10
<i>Byproducts:</i>					
Fish oil	Free	18	0-5	Free	Free
Fish meal	Free	15	Free	9	4
<i>Canned:</i>					
Salmon	Free	20	20	14	16
Tuna	20	25	20	40	25
Pilchards	20	25	20	30	20
Shrimp	25	35	40	10	20
Crab meat	25	10	30	10	20
Oysters	25	10	35	20	20

¹/These rates are expected to be achieved in a series of steps by 1970 according to plan.

West Germany and Benelux to be counterbalanced somewhat because France and Italy, with traditionally high tariffs, would import more fishery products under the new "average" common tariff level. The 10-percent duty on United States fish oil in the United Kingdom might also be reduced to the duty-free level of the Common Market. Also, higher consumer income in the Common Market may have beneficial effects on total trade.

For certain fishery commodities of interest to the United States, the 1958 national duties and the eventual Common Market external tariffs are shown in table 1.

EFFECT ON TRADE WITH UNITED STATES

With higher duty rates in major markets, we may anticipate that normal trade patterns in the Common Market countries will undergo considerable change in the next few years. Most of the Common Market import duties for fishery products will be considerably higher than those of the United States. As those duties change, Iceland and Norway may find it advantageous to seek additional markets in the United States. On January 1, 1962, in the first step toward the Common Market tariff, the Benelux duty on fish fillets increased from 0 to 5 percent; eventually this will be tripled. West German rates also increased. Those countries are important buyers of fillets from Northern European countries.



Fig. 6 - A common fisheries policy will be formulated during 1963.

Should the United Kingdom succeed, as anticipated, in joining the Common Market, its duty level which is now relatively low on most fish products, would gradually increase to the higher level of the common tariff. It is expected that Denmark and Norway would follow the United Kingdom into the Common Market. When those three important fish-producing countries join, their products will move freely within the Community and countries on the outside will have increased difficulties in surmounting the tariff barriers.

A comparison of the present United States import duties and the common external tariff of the Common Market for selected fishery products is shown in table 2.

COMMON FISHERIES POLICY

Next year, basic decisions are to be made in formulating a common fisheries policy. At this time, it is too early to know what special marketing or support devices may be used to stimulate fishery development in the Common Market. We might take heed from the agricultural policy decisions made in January 1962; the main features of the proposals thus far advanced include control of farm products through common marketing authorities, establish-

Table 2 - Comparison of Present United States Import Duties and the Common Market External Tariff for Selected Fishery Products

Product	Rate of Duty	
	United States (Percent)	Common Market ²
Groundfish fillets	About 9 1/2	18
Fillet blocks or slabs	About 4 1/2	15
Fish sticks and portions	20 and 30	20
<i>Fresh or Frozen:</i>		
Tuna	Free	25 (with limited duty-free quota)
Shrimp	Free	18
Salmon	About 11/2	10
Halibut	About 21/2	15
<i>Canned:</i>		
Tuna	12 1/2 and 35	25
Salmon	15	16
Pilchards	6 1/2	20
Crab meat	22 1/2	20
Oysters	About 18.51/2	20
Shrimp	Free	20
<i>Byproducts:</i>		
Fish meal	Free	4
Fish solubles	Free	9
Fish oil	Various rates	Free

¹/Ad valorem equivalent.

²/Rates will gradually rise to this level in steps, and will be fully achieved by 1970, possibly sooner.

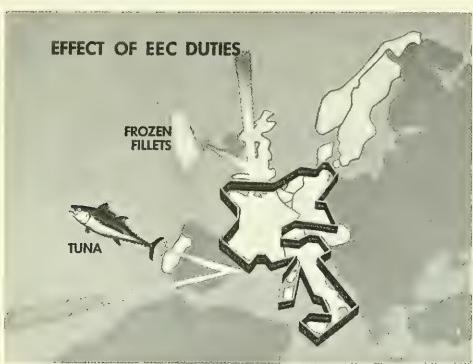


Fig. 7 - Increased Common Market import duties may divert present trade to other countries.

(3) In filling the demands of this great market, processing and marketing organizations of the Common Market will become larger and financially stronger. These concerns will become formidable competitors not only in their own markets but also in the export field.

(4) Fishing fleets, now subsidized in varying degrees, would be integrated and strengthened; larger, more efficient vessels would extend their fishing operations to more productive grounds in other parts of the world.

(5) There will be greater competition from the Common Market for fishery products now exported from Northern Europe to the United States.

NEGOTIATIONS UNDER TRADE EXPANSION ACT OF 1962

President Kennedy has asked for, and the Congress has granted him, broad new authority to negotiate trade agreements with the Common Market and other countries. In this effort, he could make reductions in United States import duties in exchange for reductions in tariffs of the Common Market. Known as the "Trade Expansion Act of 1962" (P. L. 87-794), this legislation provides that the President may lower existing duties by 50 percent, and eliminate tariffs on certain products now dutiable at 5 percent or less and on products for which the United States and the Common Market account for 80 percent or more, by value, of world exports. The effects of this program could mean increased competition for some United States-produced fishery products and increased opportunities for others. Because it has been recognized that some United States industries might be hurt by lower duties and increasing imports, a system of Federal "adjustment assistance" has been established to aid United States companies and workers injured by imports. Under this phase of the program, United States enterprises idled by increased imports may be assisted in meeting import competition and making economic adjustments primarily through a program of tax relief, loans, and technical assistance for modernization and diversification of operations. Readjustment allowances would be given to workers idled by imports.

OTHER REGIONAL ECONOMIC UNIONS FORMING

The European Common Market is already well on its way. Two economic units are now developing in Latin America. The larger of the two is known as the Latin American Free Trade Association (LAFTA), and consists of Mexico, Colombia, Ecuador, Peru, Chile, Brazil, Paraguay, Uruguay, and Argentina. The other group is called the Central American Common Market, the members of which are Guatemala, El Salvador, Honduras, and Nicaragua. In the near future, those also may have an important impact upon our fisheries.

ment of common prices, equalization of prices on imports through a system of variable levies, and in some cases quantitative restrictions on imports.

PREDICTIONS

In the near future, we might expect the following developments from the Common Market:

(1) Members will formulate a common fisheries policy that will permit freer movement of labor and capital, and provide for the establishment of community-wide fishing and landing privileges in all member countries.

(2) Under a uniform fisheries policy, there will be better control of fishery resources and more economical production.



Fig. 8 - Latin American nations are forming a free trade association.



Fig. 9 - A Central American Common Market is also developing.

MEETING THE CHALLENGE

Now, what can we do to make the challenge of the new markets an opportunity for domestic growth and development?

First, we can work to improve our fishery productivity, efficiency, and cost position.

Second, we can step up our research and development activities, transforming the increased scientific knowledge into new processes and products. Products which are unique or better than those of our competitors will gain and hold new markets abroad as well as at home.

Third, we can apply selling techniques in our markets, based on market research to fill different needs, customs, and tastes.

Efforts in those fields should strengthen our domestic economy and enhance our competitive capacities, not only with imports but in the export field.



ORIGIN OF PACIFIC COAST SARDINE CANNING INDUSTRY

"Several efforts were made during the 1890's to establish sardine cannerying on Puget Sound or in Alaska where large quantities of herring were available, but all of these operations were shortlived. The first successful Pacific Coast sardine cannery was established at San Pedro, California, in 1896. The industry developed slowly until 1917 when the pack was suddenly increased to a large amount by war demands. After the war, production was maintained and increased by extensive cultivation of the export trade."

--"Principles and Methods in the Canning of Fishery Products,"
Research Report No. 7 (page 4),
U. S. Fish and Wildlife Service.

HYDRAULIC PRESS FOR LABORATORY PREPARATION OF FISH PRESS CAKE

By Lynne G. McKee* and Richard W. Nelson**

INTRODUCTION

In the preparation of fish meal, fish waste material is often cooked and pressed to expel oil and water. The product formed is fish press cake. Fish meal results when this material is dried and ground.

In the production of experimental lots of fish meal at the Seattle Technological Laboratory, about 16 pounds of fish material are cooked and pressed to prepare one batch for the experimental fish meal dryer. Formerly, a small laboratory press with a capacity of about 4 pounds of material was used to prepare the press cake. As the use of this device required four pressings for one charge of the dryer, the pressing operation required considerable time. Also, some of the material cooled below the desired pressing temperature before the operator could complete all four pressings.

To save time and to facilitate pressing the material while it still is hot, which helps to remove the oil and water, we designed and built a press with enough capacity to handle 16 pounds of cooked material at each pressing.

The purpose of this report is to describe the design, construction, and operation of this press.

DESIGN

The press (fig. 1) consists essentially of (1) a head, (2) a hydraulic jack, (3) a pressure gauge, (4) a movable platen, (5) a stationary platen, and (6) a stand on which the press is mounted.

In the design of the press, features such as light weight, portability, and simple construction were incorporated. The construction used eliminated the need for patterns, heavy casting, and machining.

CONSTRUCTION

Extruded aluminum channel 2["] x 2["] x $\frac{1}{4}$ " was used for the head, the movable platen, and the stationary platen. The channels, cut to length, were bolted together side by side with spacers between the flanges to resist collapsing when the through bolts were tightened. Two of the units, containing eight channels each, were used--one on top of the other, with the channels at right angles--for the head of the press. The stationary platen is similar except that 10 channels were used instead of 8 and a $\frac{1}{4}$ -inch aluminum plate was attached to the upper side to serve as a liquid-tight surface. The movable platen consists of a single set of eight channels with a $\frac{1}{4}$ -inch aluminum plate attached to the lower side to serve as the pressing surface.

The hydraulic jack was mounted in an inverted position with the base of the jack bolted to the head of the press. This arrangement protects the jack from coming in contact with the expressed liquids from the fish.

The hydraulic gage was mounted on a high pressure pipe tee next to the jack.

* Formerly Food Technologist } ** Chemical Engineer } Technological Laboratory, U. S. Bureau of Commercial Fisheries, Seattle, Wash.

The pressure pump for the hydraulic jack was mounted in an accessible position on the side of the press stand. High pressure hydraulic tubing was used for the connection between the pump and the jack.

The movable platen, which is guided by four corner posts that connect the base and the head (see fig. 1), is held against the ram of the jack by four suspended coil springs. During operation, as the pressure is released, the springs return both the ram and the platen to the starting point.

In order that the expressed liquids can be caught, the edges of the stationary platen was fitted with an angle iron dam. A $\frac{1}{2}$ -inch drain outlet was located in one corner of the platen.

The entire press was mounted on an angle-iron stand fitted with casters to provide mobility.

Cost of the materials used to construct the press was less than \$350.

OPERATION

In addition to the press itself, the following equipment is needed to produce press cake: (1) 24-inch squares of press canvas, (2) a $10'' \times 10'' \times 1\frac{1}{4}''$ mold, (3) a spatula or a tamper, (4) four pieces of channel iron, and (5) $\frac{1}{8}$ -inch-mesh steel screens $12'' \times 12''$.

The press is operated as follows:

1. Lay a 24" square of press canvas on a flat surface and place the mold in the center of the canvas.
2. Fill the mold with the hot cooked fish material, using a spatula or a tamper to press the material into the mold.
3. Remove the mold and fold the cloth over the fish to make a pad approximately $1\frac{1}{4}$ " thick.
4. Prepare six similar pads to charge the press.
5. Lay four pieces of channel iron side by side on the press base

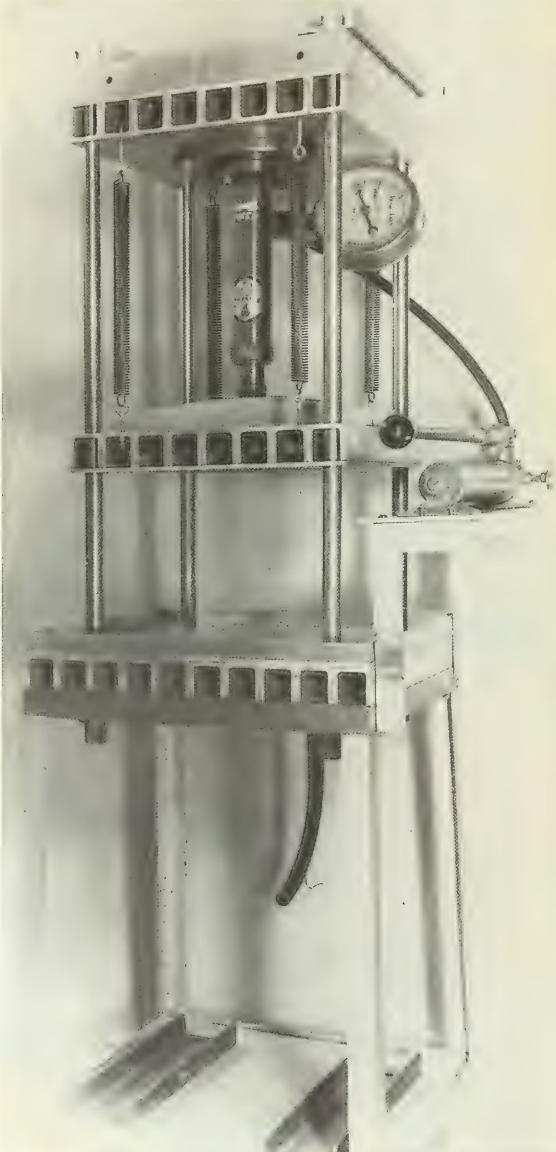


Fig. 1 - Hydraulic press for laboratory preparation of fish press cake.

and lay one of the steel-mesh screens on top. (The channel serves as a spacer to keep the bottom pad of material away from the liquid that accumulates on the stationary platen.)

6. Lay a pad of the cooked material on the screen and cover it with another screen.

7. Repeat this process until the press is filled, taking care to keep the pile of pads and screens straight.

8. Make a preliminary press to compact the pile of pads and make room for the insertion of additional pads. If at this point the pads are not flattening out evenly, release the pressure and move the entire stack of pads so that the high side is more nearly under the center of the platen. Again apply pressure. The pads should flatten evenly. If they do not, turn the pads within the stack so that the thick and thin sides of the pads will level each other.

9. Complete the final press until all the free liquid has been removed.



PRODUCT RESEARCH PAYS OFF

VOLUNTARY U.S. STANDARDS

FISH STICKS
PRECOOKED

12

already in effect or under
active development

TRENDS AND DEVELOPMENTS

Alaska

BRISTOL BAY APPROACHES

RULED ALASKA TERRITORIAL WATERS:

"The territorial waters of the State of Alaska in Bristol Bay are those waters within a line from Cape Newenham to Cape Menshikof on the Alaska Peninsula," ruled the First Superior Court of Alaska early in September 1962. This decision culminated an involved legal battle over Alaska's right to tax freezerships operating more than three miles offshore within Bristol Bay. Defense attorneys did not dispute the locations where the freezerships purchased salmon but argued that the accepted three-mile territorial limit placed the vessels outside Alaskan waters, therefore, they should not be subject to state taxation.

The Superior Court Judge stated that in his opinion the Federal Government "has asserted a claim to all Bristol Bay waters landward of a line drawn between Cape Newenham and Cape Menshikof as inland waters through interrelated administrative and judicial action" and that in order to control the fisheries of the area "jurisdiction has been, and must be, asserted to that extent."

* * * * *

RUSSIAN WHALING NEAR KODIAK:

Late in September 1962, a concentration of Russian whale catcher vessels moved into the area immediately south of Kodiak Island off Alaska. Patrol vessels traversing those waters estimated the Russian fleet at approximately 12 killer vessels. Fishing was apparently good as many whales were in evidence throughout the area. This movement appears to be a major shift of Russian whaling effort which was previously centered in the central Aleutian Islands.

* * * * *

SALMON PACK IN 1962

LARGEST IN TEN YEARS:

The Alaska canned salmon pack as of September 23, 1962, totaled 3,410,000 cases (48 1-lb. cans). This is the largest pack re-



Gill-net boat in Alaska with a load of red salmon.

corded since 1952, when the pack totaled 3,574,000 cases. The large pack this year was the result of the excellent run of pinks in Central Alaska, which accounted for 1,212,000 cases or 35.5 percent of the total Alaska pack of all species.

* * * * *

KODIAK AREA SALMON CATCH:

The total catch of salmon in the Kodiak district totaled 15,750,000 fish. Of that total, pinks accounted for 14,098,000, chums 821,000, reds 774,000, cohos 56,000, and kings 1,800.



Salmon, clam, and crab cannery in Cordova, Alaska.

fish. The pink salmon catch exceeded all previous even years in the history of the Kodiak Island fishery. The 565,770 cases of pinks packed constituted 70 percent of the total pack of 711,000 cases packed for the district.

* * * * *

SHRIMP CATCH UP IN 1962:

The Kodiak district shrimp catch in the first 9 months of 1962 was greater than the 1961 catch and that for any previous year. The Kodiak catch in 1961 was 11,084,000 pounds. The 1962 catch as of September 30 was 11,219,000 pounds.

* * * * *

HERRING 1962 SEASON SUCCESSFUL:

The herring reduction fishery in Southeast Alaska ended on September 12, 1962, following a decline in the availability of herring. The single reduction plant in operation experienced a relatively successful season with a total catch of over 13,800 short tons. The catch per unit of effort was better this season than that found in recent years. However, it is believed that the absence of competition among the several plants normally in operation may have contributed more to the success of fishing than did a possibly larger abundance of fish. Nearly 80 percent of the season's catch was four-year-old herring. The oil yield was high throughout the season.



Alaska Fisheries Exploration and Gear Research

CHARTERED TRAWLER BEGINS EXPLORATORY BOTTOM FISHING IN SOUTHEASTERN ALASKA:

Exploratory bottom fishing with the chartered trawler Yaquina was scheduled in the waters of Lynn Canal and Chatham Straits in Southeastern Alaska during October-November 1962, by the Bureau's Exploratory Fishing and Gear Research Base at Juneau. The principal objective is to determine the potential fisheries resources in Alaskan waters. The emphasis is on finding out the availability and abundance of fish and shellfish resources which might expand the commercial fisheries in that area. The princi-

pal method to be used is bottom fishing with trawl gear at regular intervals down to depths



Yaquina, Bureau of Commercial Fisheries exploratory fishing vessel.

of over 400 fathoms (2,400 feet). Crab pots and experimental gear for octopus were to be used, as well as trawls.

The results of these surveys and similar studies by the Bureau of Commercial Fisheries may pave the way toward the increased use of valuable resources which are not now completely understood.

The Yaquina was to be used continuously from early July until November 1962 on king crab exploration near Kodiak, shrimp exploration in the Seward area, and bottomfish exploration in Southeastern Alaska. The king crab exploration ended on August 19, and the shrimp exploration was completed on October 4.

Note: See Commercial Fisheries Review, September 1962 p. 15.

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STOCKS OF SHRIMP LOCATED NEAR PRINCE WILLIAM SOUND:

M/V "Yaquina" Cruise 62-2 (August 21-October 4, 1962): To define the availability of shrimp in the waters near the Kenai Peninsula and Prince William Sound was the principal objective of this 6-week exploratory cruise by the U. S. Bureau of Commercial Fisheries chartered vessel Yaquina. Shrimp catches in amounts up to 2,500 pounds

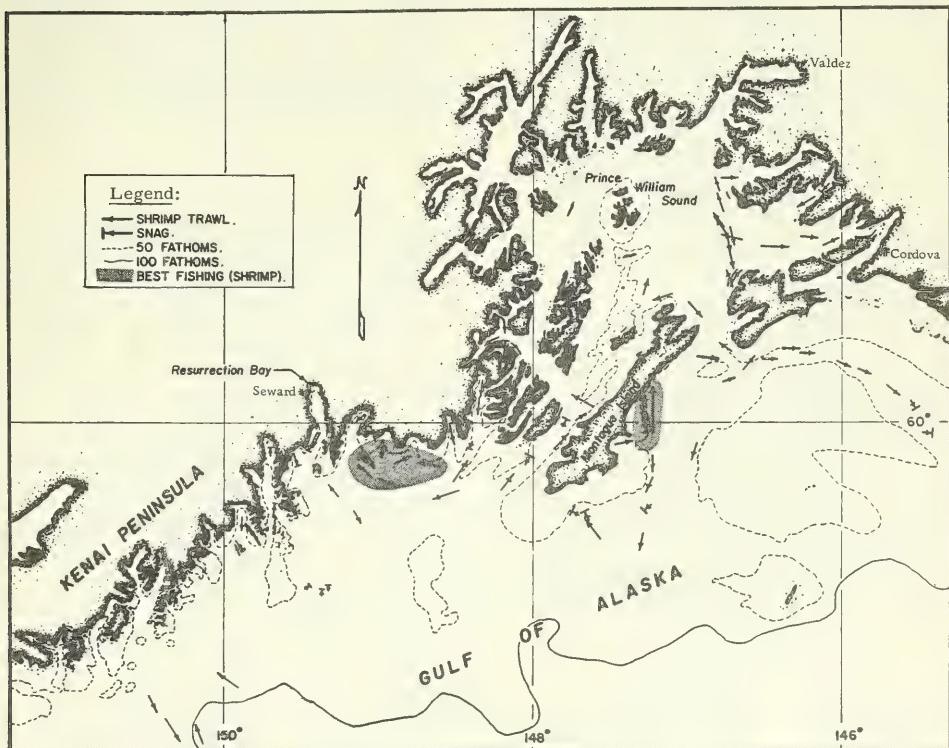
were made per 1-hour trawl drag during the trip.

A semi-balloon shrimp trawl, measuring 70 feet along the footrope, was used in a series of 93 drags lasting about one hour each. Depth intervals from 9 to 200 fathoms were sampled for indications of shrimp. Incidental to trawling, experimental shrimp pots were set at 11 locations.

Shrimp were caught at over 80 percent of the locations fished during the cruise. The dominant species caught was pink shrimp (*Pandalus borealis*), followed by side-stripe shrimp (*Pandalopsis dispar*). Other species were also caught in small quantities. Best fishing during the survey was east of Montague Island off Patton Bay. Four 1-hour trawl drags in depths from 45-75 fathoms in that area, yielded a catch of approximately 8,000 pounds of shrimp. Most of that catch was



Stem view of vessel Yaquina showing reel retrieving and stowing trawl net.



Explorations in Alaskan waters by chartered vessel Yaquina Cruise 62-2 (August 21-October 4, 1962).

pink shrimp averaging about 80 individual shrimp (heads-on) to the pound. Commercial vessels fishing for shrimp near Kodiak Island usually maintain catch rates of about 3,000 to 4,000 pounds an hour or more.

Other areas where good signs of shrimp were found included off Johnstone Bay where 1,100 pounds of shrimp were caught during two 1-hour drags. It was of particular significance that over two-thirds of the shrimp caught in that area were the side-stripe variety averaging from 28 to 36 shrimp (heads-on) per pound. Trawl catches in the vicinity of Hinchinbrook Island indicated a fair concentration of shrimp with several catches of over 500 pounds. Most of those were small shrimp not suitable for commercial use.

The results of limited pot-fishing experiments did not indicate that it was a good method of catching shrimp. Fifteen individual pots, cylindrical-shaped and measuring 3 feet long, with tunnels at each end, were set at each of the 11 locations. The baited pots were attached to a line at 5-fathom intervals and were anchored on rocky bottom where trawl sampling was not practical. The pots were retrieved after fishing for periods ranging from 12 hours to several days. Catches rarely exceeded more than a few shrimp per pot but included small quantities of large 6 to 10 count heads-on spot shrimp (*Pandalus platyceros*). This confirmed prior knowledge that this desirable shrimp species frequents rocky bottom.

King crab and halibut were tagged during the cruise in cooperation with independent studies. Hydrographic data were recorded at certain locations for information on water temperatures. Trawl catches during the cruise also indicated widespread distribution of tanner crabs. In addition, a single trawl catch near Cape St. Elias in 58 to 62 fathoms yielded 300 large scallops. It was believed that the last two species mentioned may be of commercial importance some time in the future.

Note: See *Commercial Fisheries Review*, November 1962 p. 17.



Alaska Fisheries Investigations

The following is a report of the August-September 1962 activities and studies by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Auke Bay, Alaska.

PINK SALMON STUDIES:

Attempts to regulate the even-year stock of pink salmon in Sashin Creek, Alaska, were apparently successful. The purpose of this study is to determine if the run of pink salmon in a particular stream can be re-established naturally. It is not certain whether the pink salmon entering Sashin Creek fish are strays from neighboring watersheds. However, it is concluded that for 1962, substantial straying did not occur. This was one of the questions set forth when the small even-year cycle was controlled at Sashin Creek.

The spawning escapement of pink salmon into the Olsen Bay stream was in excess of 50,000 fish. Studies so far indicate that there is an egg saturation point in the gravel beyond which further spawning would not be beneficial. In the Olsen Bay study area this may mean that the final one-fourth of the run spawned without increasing the actual amount of egg deposition. The heavy escapement of pink salmon at Olsen Bay, even after a heavy commercial fishery, resulted from the unexpected abundance of pink salmon in the Prince William Sound area.

* * * * *

RED SALMON STUDIES IN BRISTOL BAY-NAKNEK RIVER SYSTEM:

It is becoming increasingly apparent that young red salmon fry in the Bristol Bay-Naknek River system do not remain in a single lake even during their first year in fresh water. Tow net catches in September 1962 in Coville and Grosvenor Lakes indicated that the young salmon were concentrated in the outlet end of each lake preparatory to outmigration. The outmigration from Coville Lake was finished by mid-September but that of Grosvenor Lake was still in progress. In Coville River the red salmon fry outmigration seemed to be independent of light intensity; in contrast the outmigration to Grosvenor River occurred only during darkness. Brooks Lake also demonstrated a moderate outmigration of red salmon fry throughout September.

These findings have a bearing on the basic question concerning the productive capacity of the Naknek system for rearing red salmon. Lake areas in the lower system may play a vital role in the survival and abundance of red salmon races which initially utilize lake areas in the upper watershed.

* * * * *

YUKON RIVER SALMON RESEARCH:

The chum salmon run in the Rampart Canyon section of the Yukon River continued throughout September 1962. Heavy rains and severe landslides in the canyon area in early September resulted in the loss of one fish wheel and damage to the remaining wheel. Tagging operations were suspended for one week, and the last part of the late August-early September peak of the chum salmon run was missed. The chum salmon run was falling off rapidly at the end of September with a light showing of cohos coming in. Six king salmon were tagged during the week of September 23-29. To that date 7,900 chums, 1,380 kings, and 25 cohos had been tagged.

* * * * *

HERRING RESEARCH:

Eight additional radioactive herring tags were recovered in the Washington Bay herring reduction plant in September 1962, all of which had been released in 1961. From all the radioactive tags recovered so far it would seem that herring which spawn in such scattered places as Sitka, Auke Bay, Craig, and the Seymour Canal all mix together in the Frederick Sound and lower Chatham Strait areas.

Three radioactive tags had been recovered by the rejection equipment in early August in the herring reduction plant. One of these had been released by the Auke Bay Laboratory staff in 1960 and the other two in 1961. The development of suitable scanning, detection, and rejection of tagged fish from the herring production lines has been very difficult.

* * * * *

KING CRAB RESEARCH:

Research on king crabs south of the Alaskan Peninsula got under way in the summer of 1962 and in August the chartered M/V Paragon released 2,000 tags on its king crab tagging pattern between Chirikof and Trinity Islands. Most of the crabs were taken at depths around 60 fathoms. The sample area between the Shumagin and Chirikof Islands yielded very few crabs, producing only 142 tag releases.

* * * * *

MAIDEN VOYAGE OF NEW OCEANOGRAPHIC RESEARCH VESSEL:

The oceanographic research vessel Murre II returned to Juneau, Alaska, the latter part of October 1962 after completing her maiden voyage. The Murre II, is an 86-foot power scow being operated by the Auke Bay Biological Laboratory of the U. S. Bureau of Commercial Fisheries. The Bureau's oceanographer aboard stated the cruise marked the beginning of a program to relate oceanographic conditions to production of fish and shellfish. The trip served as a shakedown and training cruise for the Bureau's oceanographers and three scientists from the Douglas Marine Station of the University of Alaska.

The Murre II visited five stations during the cruise. Physical, chemical, and biological data were collected in Behm Canal, Clarence Strait, Sumner Strait, and in Chat-ham Strait off Little Port Walter and off Washington Bay. The preliminary survey included measurements of sea temperatures, salinity, oxygen content of the water, and chemical analyses for mineral content. Tows were made at each station to collect zooplankton (minute animals important as food for many species of fish) present in those waters.

American SamoaTRAINING PROGRAM FOR SAMOANS TO LEARN LONG-LINE TUNA FISHING:

The United States canning firm which operates the tuna cannery in American Samoa in January 1961 began a fishery training program for Samoans to learn the use of long lines in fishing for tuna. The United States firm in 1954 leased from the United States Government and started operating the tuna cannery in American Samoa. The cannery provides employment for about 400 Samoans.

Negotiations were under way in the summer of 1962 for another United States firm to construct a second cannery. (South Pacific Bulletin, July 1962.)



California

MIDWATER TRAWLING FOR

SALMON FINGERLINGS CONTINUED:

M/V "Nautilus" Cruise 62-N-9a-Salmon (September 5-8, 1962); 62-N-9b (September 17-21); 62-N-10a (October 1-5). Mid-water trawling in the Carquinez Strait for marked salmon fingerlings on their seaward migration were continued by the California Department of Fish and Game research vessel Nautilus. A nylon midwater trawl with a 25-foot square opening, and a cotton midwater trawl with a 15-foot square opening were used.

Trawling was conducted between 8 a.m. and 3 p.m. and each tow lasted 20 minutes. All tows were alternated between upstream and downstream, and between the north shore, center, and south shore of the channel.

A total of 150 tows completed in the Strait during the cruises yielded a catch of 48 king salmon (Oncorhynchus tshawytscha), and 15 adult rainbow trout (Salmo gairdneri). Two of the salmon were adults, one of which was marked D-RM. The marked salmon was released in the Sacramento River at Hamilton City in 1959.

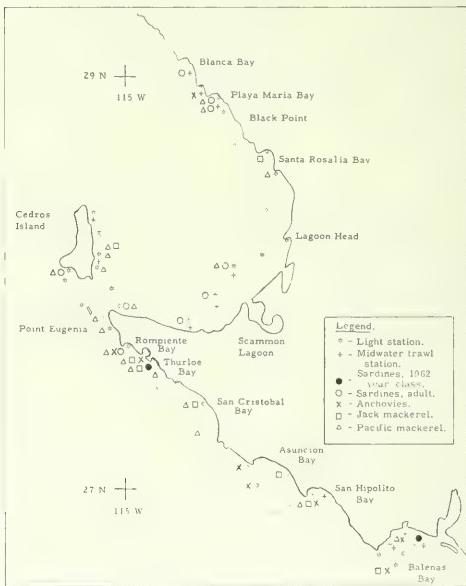
Other Species Caught by the Nautilus on Cruises 62-N-9a, 9b, and 62-N-10a	
Species	Number
Northern anchovy (<u>Engraulis mordax</u>)	53,900(est.)
American shad (<u>Alosa sapidissima</u>)	2,750
Pacific herring (<u>Clupea pallasi</u>)	2,000(est.)
Jacksmelt (<u>Atherinopsis californiensis</u>)	1,000(est.)
Striped bass (<u>Roccus saxatilis</u>)	915
Sacramento smelt (<u>Spinirinchus thaleichthys</u>)	341
Threadfin shad (<u>Dorosoma petenense</u>)	101
Northern midshipman (<u>Porichthys notatus</u>)	58
King salmon (<u>Oncorhynchus tshawytscha</u>)	48
Rainbow trout (<u>Salmo gairdneri</u>)	15
Surfsmelt (<u>Hypomesus pretiosus</u>)	9
Starry flounder (<u>Platichthys stellatus</u>)	8
Staghorn sculpin (<u>Lepidotrigla armata</u>)	3
Walleye surfperch (<u>Hyperoplus argenteum</u>)	3
Topsmelt (<u>Atherinops affinis affinis</u>)	2
Three-spined stickleback (<u>Gasterosteus aculeatus</u>)	1
Pipefish (<u>Syngnathus griseo-lineatus</u>)	1
Shiner perch (<u>Cymatogaster aggregata</u>)	1
Splittail (<u>Pogonichthys macrolepidotus</u>)	1

These cruises conducted in September-October 1962 conclude a 33-cruise series started on April 10, 1961, by the California Department of Fish and Game. All were reported in previous issues of Commercial Fisheries Review.

Note: See Commercial Fisheries Review, November 1962 p. 21.

PELAGIC FISH POPULATION SURVEY CONTINUED:

M/V "Alaska" Cruise 62-A-5-Pelagic Fish (September 18-October 7, 1962): The objectives of this cruise were to: (1) survey the sardine population to determine the amount of recruitment from this year's sardine spawning, and to measure the population density of older fish; (2) sample other pelagic species for age, length, and distribution studies; (3) evaluate the midwater trawl as a tool for sampling pelagic species; and (4) collect live sardines for blood genetic and other studies by the U. S. Bureau of Commercial Fisheries Biological Laboratory at La Jolla, Calif. The coastal waters of central Baja California, Mexico, from Ballenas Bay to Blanca Bay were the areas explored by the California Department of Fish and Game research vessel Alaska during this cruise.



M/V Alaska Cruise 62-A-5-Pelagic Fish, explorations in coastal waters of central Baja California, Mexico.

Night Light Stations: A total of 48 night light stations were occupied. Sardines were present at 9 stations, anchovies at 7, Pacific mackerel at 18 and jack mackerel at 8.

Sardines were scarce south of Point San Eugenia and around Cedros Island. Two of

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the 4 samples taken in those areas consisted of single fish-of-the-year found in catches of other species. Another sample from Rompiente Bay, was taken from a large school of 1961 year-class sardines mixed with topsmelt and Pacific mackerel. The fourth sample consisted of a few older fish taken with a sample of Pacific mackerel from South Bay, Cedros Island.

Sardines were more abundant in the southern part of Sebastian Vizcaino Bay. Large numbers of sardines were attracted on 4 out of 5 stations in that area. They were adult fish, ranging from 165 to 206 millimeters in standard length. Most of the fish were in an advanced state of maturity, with one ripe female noted in the samples taken.

Adult sardines were also caught in Playa Maria Bay. They ranged from 176 to 204 millimeters standard length, and were not in as an advanced stage of maturity as those from the southern part of Sebastian Vizcaino Bay. A total of about 900 sardines from southern Sebastian Vizcaino Bay, and 400 from Playa Maria Bay were delivered alive to the Bureau of Commercial Fisheries Biological Laboratory at La Jolla for further study.

Midwater Trawl Stations: Thirteen tows were made with the midwater trawl, alleither at the surface or within 50 feet of the surface. The first 10 tows were made during the day, the last three were made at night. All tows were made in areas where night light stations were also occupied.

Daytime tows were disappointing as compared with night light stations. The first tow in San Hipolito Bay caught nothing. The next three tows were made in Ballenas Bay, where night light stations showed thread herring to be abundant. Two of those tows again were blank, but the third caught 15 sierra ranging in size from 18 to 28 inches, and one 14-inch bonito.

The next tows were made along the east side of Cedros Island. The first of 3 tows yielded 416 bonito weighing from 1 to 2 pounds each, the second tow was a blank, and the third yielded 5 larger bonito, weighing $3\frac{1}{2}$ to 4 pounds each.

Three daylight tows were made in the southern part of Sebastian Vizcaino Bay, where sardines were known to be abundant

from night-light work. No fish were caught in those tows.

The last three tows were made at night, between Playa Maria and Blanca Bays. Sardines had been caught in Playa Maria Bay on a light station the previous night. A trawl tow in that area yielded 450 sardines and 30 squid mixed with a few bat rays, Pacific mackerel, and round herring. The second tow, off False Bay, yielded pompano and a few anchovies, while the last tow, in Blanca Bay, caught 60 sardines and about 500 squid. The sardines caught in those tows were adult fish, and the samples appeared similar in all respects to the night-light sample from Playa Maria Bay. No schools had been sighted visually or with the depth finder during those tows.

It was evident that daylight tows did not produce samples comparable to night-light samples. This may have occurred because the same fish were not available in the same areas during the day, or because the fish were able to see and avoid the net during daylight. But the few night tows that were made indicated good comparability. Whether or not night tows will be comparable under a variety of conditions remains to be tested.

Only 9 schools were sighted during 300 miles of night scouting between stations. Although scouting conditions were often poor, with poor phosphorescence and choppy seas, schools were not evident even when scouting conditions were good.

The weather was fair during most of the cruise, although a tropical storm south of Point Eugenia in the early part of the cruise, and strong westerly winds on the last working day caused a loss of two nights' work.

Sea surface temperatures ranged from 64.2° F. off Black Point to 74.8° F. off Abreojos Point.

Note: See Commercial Fisheries Review, November 1962 p. 18.

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Airplane Spotting Flight 62-9-Pelagic Fish (September 4-6, 1962): To assist in evaluating a midwater trawl as a tool for sampling the pelagic environment by locating fish schools and guiding its research vessel Alaska over them was the objective of this aerial survey by the Twin Beechcraft N5614D of the California Department of Fish and Game. On this flight, the aircraft surveyed the inshore area from Long Beach to

San Diego, and the offshore islands and banks of southern California and northern Baja California, Mexico.

Low clouds and poor visibility limited scouting to the afternoon on each day of the flight when conditions varied from poor to fair.

The coastal area from Long Beach Harbor to the United States-Mexican Border was scouted on the first day but no fish were sighted. There was extensive red water in Long Beach Harbor, and off Newport Beach the organisms responsible for the red water had converged in drifts at oblique angles to the shore. Small patches of red water were sighted off Laguna Beach, Doheny State Park, San Mateo Point and Point Loma.

On the second day of the flight, the area surveyed was from San Diego to the Coronados Islands, then to Sixtymile Bank, Cortes Bank, San Clemente and Santa Catalina Islands. A cloud deck between 500 and 1,000 feet above the ocean covered most of the general area. Because of that, flying was at a lower altitude than the normal 1,500 feet. An unidentified whale and 16 albacore boats were sighted off Sixtymile Bank. Scouting conditions around San Clemente and Santa Catalina Islands were only fair because of some scattered clouds.

The research vessel Alaska was notified of the three Pacific mackerel and two unidentified fish schools sighted off the south-east end of San Clemente Island. A small purse seiner was making a set in that area, and later delivered 10 tons of Pacific mackerel to the cannery. The Alaska made a midwater haul in the general area about 7 hours later and netted 16 jack mackerel, as well as an assortment of small, non-commercial fish species and invertebrates.

A total of 7 deep schools believed to be jack mackerel, were sighted off the south-east end of San Clemente Island on the last day of the flight. They were round, yellowish-brown schools that did not flash. The research vessel was directed over one of the schools and as she went over it, divided it into two separate schools. The depth-finder aboard did not detect any traces of the school. The midwater trawl had not been set. The second school successfully evaded the vessel and the net. The midwater trawl limited the maneuverability of the vessel,

which together with the speed of the fish school, prevented catching any fish.

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Airplane Spotting Flight 62-10-Pelagic Fish (September 10-12, 1962): To determine the distribution and abundance of pelagic schools, the inshore area from the United States-Mexican Border to Point Conception was surveyed from the air by the California Department of Fish and Game's Cessna "182" 9042T.

The first day's survey covered the area from Redondo Beach to the United States-Mexican Border. A total of 21 anchovy-schools were observed off Point Loma. The anchovy concentration between Point Loma and the border, present the six months previous to September 1962, was not seen on this flight.

On September 12, the last day of the flight, the area from Redondo Beach to Point Conception was surveyed. Thirteen anchovy schools were sighted south of Goleta Point and 17 off Pitas Point. Both of those school groups were only 200 to 300 feet offshore. That number of schools was small compared to the hundreds usually found in the area.

During the month of August, the anchovy schools observed from Goleta to Ventura were also 200 to 300 feet offshore, instead of 1 to 3 miles offshore as they had been during the previous six months. An influx of bonito may have caused the change in location of the anchovy school groups.

Small patches of red tide were present in many places along the coast. It was impossible to survey the area north of Point Conception on this flight because of cloudy weather.

Note: See Commercial Fisheries Review, November 1962 p. 20.

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Airplane Spotting Flight 62-11-Pelagic Fish (October 16-17, 1962): To determine the distribution and abundance of pelagic schools, the inshore area from the United States-Mexican Border to Santa Cruz was surveyed from the air by the California Department of Fish and Game's Cessna "182" 9042T.

The coastal waters from Los Angeles International Airport to Santa Cruz were surveyed on the first day's flight. A total of 13 anchovy schools were counted south of Cape San Martin. Between the Salinas River and Monterey, 46 anchovy schools were counted.

On October 17, the coast from the United States-Mexican Border to the Los Angeles International Airport was surveyed. Three small schools, probably anchovies, were observed off the "Barn," a familiar local landmark between Dana Point and Oceanside. Red tide was prevalent along the coast from Santa Barbara to Oceanside, and also the inshore waters of Monterey Bay. The color of the red tide had faded since the aerial survey conducted in August 1962. The brightest red tide in southern California was in the areas between Gorda Point and Point Hueneme, and from Long Beach to Newport. Both those areas are flat, shallow, and sandy. Red tide was negligible off rocky shores such as Palos Verdes and much of central California.

Note: See Commercial Fisheries Review, November 1962 p. 20.

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ABALONE GROWTH STUDIES CONDUCTED FOR COMMERCIAL AND SPORT FISHERY:

M/V "N. B. Scofield" and M/V "Mollusk"
First Cruise 62-S-5 and 62-M-1-Abalone
(August 15-27, 1962); Second Cruise 62-S-6
and 62-M-2-Abalone (September 5-17, 1962);
The objectives of these cruises were to: (1)
examine areas of commercial and sport-abalone fishing, (2) examine established stations, (3) collect samples for maturity and growth studies, and (4) tag a limited number of abalones for transplanting experiments.
The mainland coastal areas of Avila and San Simeon, and the Channel Islands of Santa Catalina, San Clemente, Santa Barbara, San Nicolas, Santa Cruz, Santa Rosa, and Anacapa, were explored by the California Department of Fish and Game research vessels N. B. Scofield and Mollusk during August and September 1962.

Results of the First Cruise by area were:

Avila: No abalones were found on any of the dives. There was no explanation for this since the bottom and general environment appeared suitable for them.

San Simeon: The abalones sampled here had well-developed gonads and appeared to be approaching spawning. Sizes ranged from 153 to 216 millimeters but most were between 190 and 198 millimeters. All but two showed evidence of the previous season's growth. Several had added over 2.5 centimeters of shell. This season's growth ap-

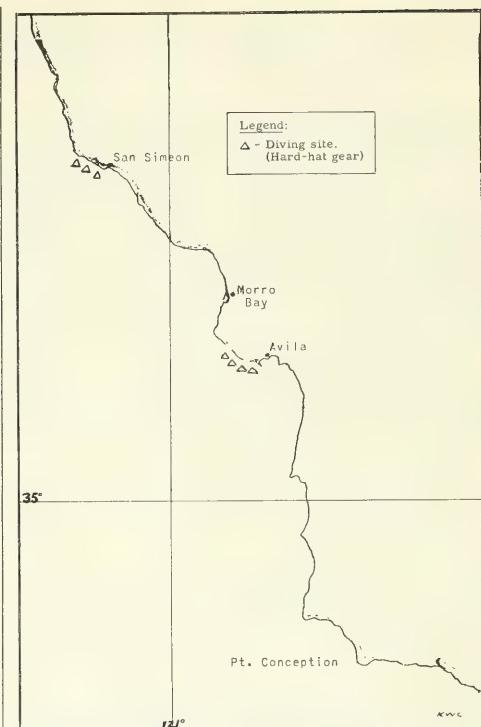


Fig. 1 - Shows diving stations during Cruises 62-S-5 and 62-M-1 by research vessel N. B. Scofield and Mollusk.

peared to be just starting; most of the sampled abalones had added 1 to 2 millimeters of shell.

Because of rough weather, plans for diving along the mainland coast were changed and operations were shifted to San Miguel and Santa Cruz Islands.

San Miguel Island: At Station ISM, considerable bottom changes had taken place since the previous year. Sand had moved in over large areas, almost completely covering the rocks; most of the kelp was growing through the sand but no abalones were present. At the east end of the station, rocks were almost bare and covered with sea urchins. In the middle area, the kelp growth was so thick it was difficult to get through, but no abalones were found. Abalones were finally located at the extreme west end of the area. Many young were found on the undersides of rocks. Forty abalones, 144 to

220 millimeters across, were collected for Marineland. Many of those showed evidence of the previous season's growth, and only 1 or 2 of them had started this season's growth.

Santa Cruz Island: Dives were made at Scorpion Cove, a representative abalone area. Almost all red and pink abalones collected showed considerable growth for the previous season. The ratio of 42 red to 17 pink abalones compared favorably with the trend first observed a year earlier (that the red abalones are increasing in numbers on the north shore of Santa Cruz Island). Sizes in the sample of red abalones collected ranged from 148 to 201 millimeters but most were between 175 and 190 millimeters.

Santa Catalina Island: At Harbor Reef (Station 1C), the kelp had continued to return and was about as concentrated as it was in 1957, before the influx of warm wa-

ter. Many young pink abalones, all of which were in good condition, were observed feeding. Most showed new shell growth but not an exceptional amount.

Results of the Second Cruise by area were:

Santa Rosa Island: An effort was made to inspect black abalones tagged in 1961 at Station ISR, but rough weather prevented sampling them.

Anacapa Island: Diving was delayed because both divers working on this project had mild respiratory infections. First dives were made on the north side where bottom conditions appeared good, but abalones were scarce. Skin and SCUBA divers frequent this area and as a result it is heavily fished, which may account for the scarcity of abalones. At Anacapa Station IA, on the south side, few

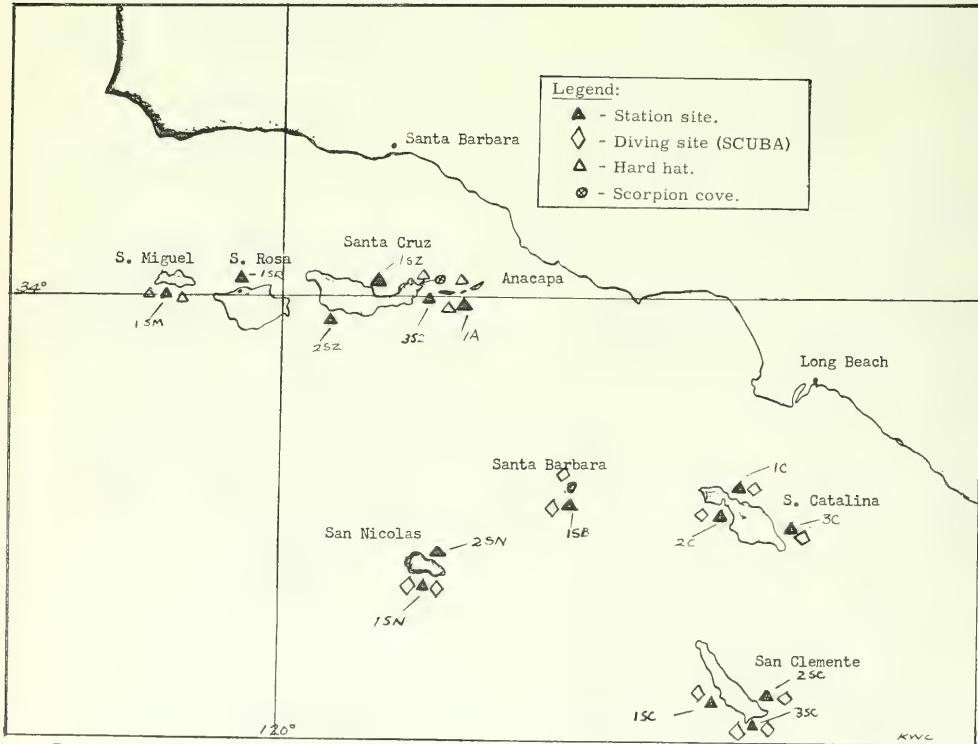


Fig. 2 - Shows stations and diving sites during Cruises 62-S-6 and 62-M-2 by research vessels N. B. Scofield and Mollusk.

abalones were observed. Kelp continues to return, but bottom conditions unfavorable to abalones (increases in sand and sea urchins) appeared to be spreading.

Santa Barbara Island: At Station ISB, kelp was not as dense as a year earlier. Many abalones were close to shore and on the undersides of rocks, and there was no evidence of unusual growth. Spot dives on the north side of the main island in the thick growth of Postelsia palmaeformis revealed only an occasional abalone, but on the edge of kelp beds, great concentrations of sea urchins were observed.

San Nicolas Island: A sample of 40 red and 11 pink abalones was taken from Station ISN. Reds ranged from 65 to 230 millimeters across, with 25 of them between 200 and 230 millimeters. Considerable growth of the previous year was evident on almost all shells, and only a small amount for the current season.

Pink abalones showed recent growth of from 2 to 4 millimeters. Both the red and pink species had well developed gonads, approaching spawning condition. The greatest abalone concentrations were found in 50- to 60-foot depths.

San Clemente Island: Abalones appeared to be less numerous at Station ISC than the year earlier. The previous season's growth ranged between 3 to 5 millimeters, and little or no growth for this season was observed for pinks. Growth on green abalones was highly irregular, ranging from 0 to 2 inches.

At Pyramid Cove (Station 2SC), pink and green abalones were found in large concentrations. In some areas they were stacked 2 and 3 deep. Abalones were not present in such numbers the previous year in this area. Several of the greens were in spawning condition but the pinks were not.

At China Cove (Station 3SC), commercial divers were working, but dives in connection with this project were made in the immediate area. Legal-size pink abalones were scarce. The commercial divers had been working for several hours and had only a few dozen abalones. This area has been heavily worked by commercial divers during the past year.

Santa Catalina Island: Abalones at Station 2C were more numerous than the previous year and there was a noticeable increase in small (1- to 3-inch) individuals.

A pink abalone tagged in October 1958, which had grown 18 millimeters by September 1962, was recovered from this station. All 145 abalones taken at San Nicolas, San Clemente, and Anacapa were measured, tagged, and placed in Station 2C. At Station 3C (Avalon Harbor), about 30 pink abalones tagged in 1957 with plastic disks were found. The disks had completely deteriorated and only the wire remained.

At Station IC, empty shells of two red abalones transplanted in 1956 were recovered. Both were recovered in 100 feet of water and neither one had grown after tagging. At a depth of 115 feet, three young white abalones (H. sorenseni), $\frac{3}{4}$, $1\frac{1}{2}$, and 4 inches across, were recovered from the undersurface of a rock. Kelp had returned on the reef and was about as thick as in 1956. Many young pinks were observed and all appeared to be in good condition.

Summary of Observations: In general, the environment of all areas showed a progressive improvement in food supply for the present abalone population. This was reflected in an increase in the numbers of growing young abalones in most areas. Where commercial fishing pressure had been heaviest, legal-size abalones were scarce. Where skin-diving pressure had been heavy (Anacapa), abalones of all sizes were scarce. Most of the abalones showed considerable growth for the previous season. This season's growth was just beginning.

Gonad examinations indicated that spawning had not yet occurred, although most were approaching ripeness. The over-all condition of the abalone resource is encouraging from a biological standpoint. If present conditions prevail, it should remain so for the balance of the season.



Cans--Shipments for Fishery Products

JANUARY-AUGUST 1962:

The amount of steel and aluminum consumed to make cans shipped to fish and shellfish canning plants during January-Au-

gust 1962 was 7.5 percent above that used during the same period in 1961. Prior to

1962, the figures covered only tinplate cans, but beginning with January 1962 aluminum cans are included. It is believed that only a small amount of aluminum is being used in cans for fishery products at present.

A total of 2,247,559 base boxes of steel (tinplate) and aluminum were used in the manufacture of cans shipped to fishery plants during the first eight months of 1962, whereas in the same period of 1961 (when only tinplate was reported) 2,056,663 base boxes of steel were consumed. The increase was mainly due to larger packs of Maine sardines, shrimp, salmon, mackerel, and tuna during 1962.

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BY AREAS, JANUARY-JUNE 1962 AND 1961:

A total of 1,510,280 base boxes of steel and aluminum were used in the manufacture of cans shipped to fishery firms during the first half of 1962. Of the total, 73.9 percent was used in cans for shipments to the Pacific Area or West (including Alaska and Hawaii). The bulk of the fish-canning facilities are located in the Pacific Area. The Pacific Area was followed by the Eastern Area with 23.0 percent. The



Southern Area and the Central Area combined used only 3.1 percent.

The over-all total in the first half of 1962 was up 4.0 percent from that for the same period of 1961. An increase of 6.9 percent in the amount of metal used in cans for shipment to the Pacific Area was partly offset by a drop of 3.5 percent in the total amount used for the Eastern, Southern, and North Central Areas. The increase in the Pacific Area was due to a greater pack of tuna.

The average wholesale price index for tinplate cans during January-May 1962 showed an increase of 2.7 percent over the average in 1961 and an increase of 5 percent over the average in 1957-59. The average wholesale price index for tinplate cans in January-May 1962 was 80.4 percent above the average in 1947.

Notes: (1) Statistics cover all commercial and captive plants known to be producing cans. The data for 1961 cover only shipments of steel (tinplate) cans, but the data for 1962 cover shipments of steel and aluminum cans. It is believed that only a small amount of aluminum is being used in cans for fishery products at present. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. The tonnage equivalent figure for 1961 data is derived by use of the factor 23.0 base boxes per short ton of steel. The tonnage equivalent figure for 1962 data is derived by use of the factor 21.8 base boxes per short ton of steel.

(2) See Commercial Fisheries Review, August 1962 p. 17.



Central Pacific Fisheries Investigations

TUNA STUDIES IN SOUTH PACIFIC CONTINUED:

M/V "Charles H. Gilbert" Cruise 59 (July 23-August 15, 1962): One of the objectives of the cruise was to conduct long-line

**U. S. Domestic Shipments of Metal Cans for Fishery Products,
First and Second Quarters, 1961 and 1962**
(Base Boxes of Metal Consumed in the Manufacture of Cans for Fishery Products)

Receiving Area	First Quarter		Second Quarter		Jan.-June	
	1962	1961	1962	1961	1962	1961
East ² /.....	158,531	2/	189,556	2/	348,087	2/
Southern.....	13,403	2/	32,668	2/	46,071	2/
North Central.....	63	2/	29	2/	92	2/
Total ² /.....	171,997	193,223	222,253	215,510	394,250	408,733
West ³ /.....	414,199	335,133	701,831	708,423	1,116,030	1,043,556
Total all areas ..	586,196	528,356	924,084	923,933	1,510,280	1,452,289

¹/Includes Puerto Rico.

²/The grouping of States by geographic areas for reporting purposes was changed in 1962 so only total shipments in 1961 to the East, Southern, and North Central areas are shown.

³/Includes Alaska and Hawaii.

fishing for tuna and other climax predators so as to provide specimens for studies by the University of Washington. The Line Islands and waters southwest of Christmas Island were the areas where the U. S. Bureau of Commercial Fisheries research vessel Charles H. Gilbert operated during this cruise. The vessel, which departed Honolulu, Hawaii, on July 23, 1962, made bathythermograph casts, collected surface salinity samples, dropped drift cards, and made plankton tows on the initial leg of the cruise to Christmas Island, where she arrived on July 29. The vessel departed Christmas Island on that same day and conducted long-line fishing, plankton tows, Nansen bottle casts, and serological collecting in waters

dropped, on the return trip to Honolulu, where the vessel arrived on August 15.

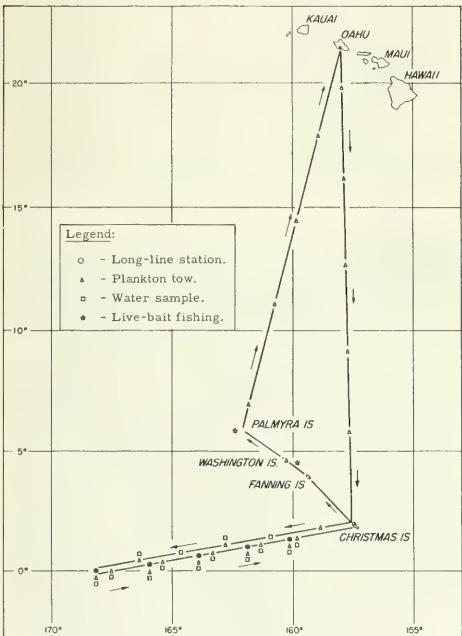
Five long-line stations were occupied at various locations. Sixty baskets of 6-hook, 210-fathom main-line gear with 16-fathom droppers were fished at each station. The catch rate of tuna (number per 100 hooks) ranged from 0.6 at Station 11 to 4.2 at Station 27. A total of 23 yellowfin, 9 big-eyed, 4 skipjack, 1 albacore, 4 marlin, 1 sailfish, 1 wahoo, and 5 sharks were caught at the 5 long-line stations.

Tissues were taken from long line-caught fish and frozen for further study by the University of Washington. Those tissues were: samples of eyes: 7 yellowfin; samples of livers and muscle: 23 yellowfin, 9 big-eyed, 4 skipjack, 1 albacore, 4 sharks, 4 marlins, 1 sailfish, 1 wahoo. In addition, samples of eyes, muscle, liver, and vertebrae were collected from 3 yellowfin taken by live-bait fishing near Palmyra Island, and 1 yellowfin caught trolling near Fanning Island.

Another objective was to collect plankton using 1-meter open nets as follows:

1. Eight 30-minute surface plankton tows and 30-minute tows at a depth of approximately 50 meters (164 feet) were made using 1-meter open nets in the waters southwest of Christmas Island. Displacement volumes ranged from 73 to 255 ml. after large organisms were removed.
2. On runs between Honolulu and the Line Islands, a 30-minute surface plankton tow was made each evening at 9 p.m. with a 1-meter open net. Those samples were to be turned over to the University of Washington after pontellid copepods were removed.

The third objective was to collect water samples to a depth of 300 meters (984 feet) using Nansen bottle casts. Five Nansen bottle casts (without reversing thermometers) were made at each long-line position to obtain water samples above and below the thermocline. Four Nansen bottles were positioned above the thermocline and 4 bottles below the thermocline. Samples from each group of 4 bottles were pooled together. In addition, a 5-gallon surface water sample was obtained at each cast and at several other locations.



Track Chart of Charles H. Gilbert Cruise 59 (July 23–August 15, 1962).

southwest of Christmas Island, returning there on August 6. During August 8–10, live-bait fishing was conducted along the Line Islands. Following departure from Palmyra Island on August 11 (the day after arrival there) bathythermograph casts were made, surface salinity samples collected, plankton tows were made, and drift cards

Collecting blood samples from tuna and marlins for serological studies was the fourth objective, as follows:

1. From up to 300 skipjack caught by live-bait fishing methods, blood was collected from 1. In addition, blood samples were obtained from 30 yellowfin obtained by live-bait fishing outside Palmyra Island, and from 1 yellowfin caught by trolling.
2. From all tuna and marlins caught by long-line fishing, blood samples were collected from the following long line-caught fish: 23 yellowfin, 9 big-eyed, 4 skipjack, 1 albacore, 1 wahoo, 4 marlin, and 1 sailfish.
3. Total blood samples collected: 54 yellowfin, 9 big-eyed, 5 skipjack, 1 albacore, 4 marlin, 1 sailfish, 1 wahoo.

Other details of the cruise were:

1. Bathymeterograph casts and collections of surface salinity samples were made every 30 miles on runs between Honolulu and Christmas Island, between Palmyra Island and Honolulu, and also at long-line fishing locations.
2. Stomach contents of 25 long-line caught tuna and marlins were presented for studies at the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu. Skeletons of 3 big-eyed tuna were retained for studies at the Bureau's Honolulu Laboratory.
3. The thermograph was operated continuously throughout the cruise.
4. Eight skipjack, 8 yellowfin, and 37 unidentified fish schools were sighted during the cruise.
5. One skipjack, 1 yellowfin, and 1 rainbow runner (*Elagatis bipinnulatus*) were caught by surface trolling.
6. Drops of drift cards (20 cards per drop) were made every hour for the first 6 hours after departure, and thereafter every 3 hours until 15° N. On the return trip, one group of drift

cards were dropped every hour commencing 4 hours from Honolulu.

Note: See Commercial Fisheries Review, September 1962 p. 16.

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FISH BEHAVIOR NEAR

FLOATING OBJECTS STUDIED:

M/V "Charles H. Gilbert" Cruise 60 - Koalana I (September 26-October 12, 1962): Observations during this cruise on the ecology and behavior of animal life in the vicinity of a floating object at sea were made jointly by the research vessel Charles H. Gilbert and the raft Nenue, both operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu. The area covered was in waters ranging up to 10 miles off the Kona coast of Hawaii between latitudes 19° and 20° N.

This first raft expedition, defined as Koalana I, was an experimental joint research project utilizing the raft so as to study the makeup and behavior of mixed fish communities which form under drift logs and other flotsam in the ocean. In addition to other related environmental observations the Gilbert which left her base at Kewalo Basin,



The underwater caisson being lowered on to the Nenue I from the mothership, Charles H. Gilbert.

Honolulu, on September 26 with the Nenue aboard acted as support vessel to the raft which drifted within 11 miles off the Kona coast during the cruise period.

A total of 106 man-hours of direct observation was made from the underwater ports of the raft, and 10 man-hours of direct observation from the underwater ports in the bow chamber of the Charles H. Gilbert while the vessel took samples and scouted for fish around the raft at distances of 1 and 2 miles.

The most common members of the fish community which formed under the raft were the nomeid (Psenes cyanophrys), the balistid (Canthidermis maculatus), and mahimahi (Coryphaena hippurus). Although the raft never drifted for more than 50 hours without having to be moved because of either drifting to shore or dangerously close to rough water, as many as 60 nomeids, 33 balistids, and 33 mahimahi were at times present. In addition, the following fishes were seen from the raft chamber: maomao (Abudefdud abdominalis), wahoo (Acanthocybium solandri), skipjack tuna (Euthynnus pelamis), opelu (Decapterus pinnulatus), pilotfish (Naucrates ductor), Kahala opio (Seriola aureovittata), a rare omaka (Caranx kalla), kaku (Sphyraena barracuda), whitetip shark (Carcharhinus longimanus), mobulids, istrophorids, mullids, and many unidentified fish.

Porpoises were also observed during this period. Behavior observations were made on as many of those species as possible. The permanence of a species' association to the raft was noted, and rates of accumulation for each species were recorded. Stomach samples and fish specimens were preserved whenever possible. A total of 1,600 feet of 16 millimeter film and 88 still pictures were taken from the raft's viewing ports, and of the general operation.

Depth casts and weather observations were made every 6 hours after the raft was in the water. A total of 44 fish schools were seen from the Charles H. Gilbert, and only one-half of those schools were accompanied by birds. Location and movement of fish schools relative to the raft's position were measured whenever possible.

Plankton was collected during the cruise for use in rearing tuna larvae. A total of 23 surface plankton hauls were made with the 1-meter net at 2 a.m. and 2 p.m. Very few

fish eggs were taken in night hauls. Although more fish eggs were taken in day hauls, the bulk of the catch consisted of crustacean eggs. Larvae were hatched from eggs of several fish species, but only a few of them were reared past the yolk sac stage. No tuna eggs were identified on this cruise. A total of 9 night-light fishing stations were also worked in order to catch young tuna for rearing in a shipboard aquarium. Only one tuna-like fish (Auxis sp.) was taken, and it died a few days later when the water circulating pump had to be turned off.

A total of 289 drift cards was released. These were released 10 at a time at each bathythermograph cast.

Note: See Commercial Fisheries Review, November 1962 p. 22.

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FISH BEHAVIOR STUDIED ON FIRST RAFT EXPEDITION:

A unique and quite unusual type of research craft, the raft Nenue, was brought back to Honolulu on October 12, 1962, after two weeks of scientifically productive drifting off the Kona coast of Hawaii. The expedition, designated Koalana I, was the first attempt in Hawaiian waters to make direct observations of the communities of fish and other marine animals which congregate under objects floating in the ocean.

Four scientists of the Bureau of Commercial Fisheries Biological Laboratory at Honolulu who were on the Nenue while she was drifting, were enthusiastic about the opportunities which the raft afforded for sustained study of the behavior and interactions of a variety of fish species. But they admitted that over 100 hours in the cramped observation capsule under the raft, concentrating on the circling fish while the 12-by-12 foot Nenue bobbed on the swells, had been a severe test of their stomachs' devotion to science.

The Laboratory's research vessel Charles H. Gilbert launched the Nenue about 10 miles off Kealakekua Bay on September 27 and stood by within sight and walkie-talkie range of the raft at all times. The Nenue drifted north along the Kona coast unexpectedly fast, sometimes at 4 miles an hour. This resulted in the Charles H. Gilbert having to pick the raft up four times to keep it from drifting ashore or out into rough channel waters. A fish behavior specialist on the

expedition reported that each time the Nenue was placed in the sea, small fish began to be attracted to it within 5 or 10 minutes. The first fish arrivals were generally rudderfish,



The Nenue I adrift off the Kona Coast of the Island of Hawaii. similar to the species nenu for which the raft was named. At times there were as many as 60 of that species under and around the raft. Small triggerfish (closely related to the familiar humuhumunukunukuapuaa) were also numerous and regular members of the fish groups following the raft.

Mahimahi (dolphin) were often about the raft, sometimes as many as 30 at a time. Those colorful, fast-swimming fish would come in under the Nenue and rub their sides against its oil-drum floats, then range out to the far periphery of the drifting fish community where, the scientists guessed they may have been picking off stragglers or intercepting new recruits attracted by the raft. The mahimahi mingled harmoniously with the triggerfish, but they voraciously harried a stray jack, similar to the aukle, keeping it holed up under the raft for several hours. The jack finally escaped by joining the pilotfish escort of a passing whitetip shark.

From the windows of their observation capsule in the raft, the biologists also saw porpoise, marlin, manta rays, barracuda, opelu, wahoo (ono), and skipjack tuna (aku). With the exception of the wahoo, those fish gave no indication that their behavior was affected by the presence of the raft and remained in its vicinity only briefly. When the Nenue was moored to the anchored Charles H. Gilbert, with a strong current running by, it failed to attract even the rudderfish and triggerfish which were its almost constant companions when it was drifting free.

Preliminary consideration of the results of the expedition Koalana I points to several areas of possible scientific and commercial fisheries application. The raft Nenue's observers were aware of the regular use of rafts in the dolphin fishery of Japan, but they were unprepared for the rapidity with which considerable numbers of mahimahi gathered around their raft, particularly since it has commonly been thought that drift logs and other flotsam do not effectively attract large fish until they have been drifting long enough to accumulate a growth of seaweeds and a population of small invertebrate animals. The unexpectedly wide variety of fish species and large numbers of individuals seen from the Nenue offer some promise that floating observation posts could provide an additional and useful technique for estimating the abundance and composition of the fish resources of an area. There were some indications on expedition Koalana I of rather definite changes in the make-up of the raft's following as it drifted into different locations at varying distances from shore. If further observations show those changes to be regular ones, they should give new insights into the relations between some commercially important fish and their environment.

Many of the observations made by the scientific raftsmen were recorded in still and moving pictures, and numerous specimens were collected for identification, and for examination of their stomach contents. Detailed analysis of the data collected, and of similar observations made from the underwater viewing chambers of the accompanying vessel Charles H. Gilbert at various distances from the raft will furnish a basis for more sharply focused experimental work on future voyages to be made by an improved raft.

Note: See Commercial Fisheries Review, November 1962 p. 22.

Fish Protein Concentrate

NATIONAL ACADEMY OF SCIENCES SPURS INTERIOR DEPARTMENT RESEARCH:

Conclusions by a National Academy of Sciences panel that "a wholesome, safe and nutritious product can be made from whole fish" has given the U. S. Department of the Interior a "green light for accelerated research into manufacture of fish protein concentrate (FPC), a new source of food for the world's hungry," Secretary of the Interior Stewart L. Udall reported on November 8, 1962.

Fish protein concentrate is made by reducing fish to a fine white powder or a liquid by chemical, enzymatic, or other means. The resulting product can be added to any foods. By utilizing the unharvested catch of fish in United States waters alone, a sufficient quantity of animal protein could be produced to supplement deficient diets of one billion people for 300 days at a cost of less than one-half cent per person per day, Secretary Udall reported. Most of those fish today are not commercially marketed.

On the request of Secretary Udall, the National Academy of Sciences appointed a seven-man panel to study the safety, wholesomeness, and nutritional features of fish protein concentrate as well as other questions related to its potential.

The report, sent to Secretary Udall by Dr. Frederick Seitz, Academy president, stated in part:

"The committee concluded that a wholesome, safe, and nutritious product can be made from whole fish. The committee accepted the definition of a 'wholesome product' to be a product which is healthful and promotes physical well-being. It stressed the necessity of maintaining high standards in the preparation of the concentrate."

While stating that there is no immediate nutritional need for such a product in the United States, the committee held that it would be of "great value in meeting food problems presented in times of emergency or by expanding world population."

Commending the Academy for its carefully considered opinions on a matter of highest importance to meeting the nutritional problems of the world, Secretary Udall said:

"The United States, through research conducted by the Bureau of Commercial Fisheries, has assumed leadership in providing this lifeline of the future to the world's undernourished. It is estimated that in the United States coastal waters alone, fishermen could harvest for fish protein concentrate purposes over 7 billion pounds of fish annually without disturbing the brood stock necessary to assure continued harvests. Many of these fish today have little or no commercial value."

The "desperate need" for a low-cost source of animal protein is evidenced, Secretary Udall said, in the fact that studies show "approximately two billion of the world's population now suffer from protein lack," he added.

"FPC, which keeps indefinitely and is easily transportable to the most remote areas, can meet this need and at the same time provide limitless economic benefits to the commercial fishing industry," he added.

Secretary Udall said that he would give "the highest priority" to a program of accelerated research on FPC. Legislation providing about \$500,000 for such a program was lost when the supplemental appropriations bill was not enacted.

The National Academy of Sciences panel conducting the survey included: W. H. Sebrell, Jr., M.D., Institute of Nutrition Sciences, Columbia University; James B. Allison, Ph.D., Bureau of Biological Research, Rutgers University; Grace A. Goldsmith, M.D., School of Medicine, Tulane University; Harold Humphrey, B.S., Consultant in Food Tech-

nology, UNICEF; H. S. Olcott, Ph.D., Institute of Marine Resources, University of Calif., Berkeley; M. B. Schaefer, Ph.D., Institute of Marine Resources, Scripps Institute of Oceanography, La Jolla; R. E. Shank, M.D., School of Medicine, Washington University.

The report concluded: "Until a suitable and acceptable fish protein concentrate product can be made available commercially, the committee is of the opinion that there should be no consideration of a definition and standard of identity under the Food, Drug, and Cosmetic Act and that the postponement of public hearings in the matter should be continued indefinitely. Unduly restrictive regulations and judgments as to the wholesomeness, safety, and nutritive value should not be made during the period of research on and development of new and possibly valuable food products, such as fish protein concentrates. Such actions constitute a serious handicap tending to discourage research and development initiative."

"The committee recommends that government agencies as well as private industries be encouraged to pursue basic and developmental research with the assurance that new wholesome, safe, and nutritious food products resulting therefrom will be made available to consumers without prejudice:

"The United States is blessed with an abundance of food and, through research, has attained preeminence in food production and technology. In order to maintain leadership, broadly based and continuing research, with the freedom essential thereto, is an absolute necessity. Although there may be no demonstrable nutritional or economic need at the present time by the people of the United States for a fish protein concentrate, the committee reemphasizes its opinion that the public should not be denied the availability of safe and nutritious new products, and American industry should not be deterred from the research necessary to make such products available. The production of good foods economically should be encouraged by all means, and especially the development of procedures for the most complete and effective use of protein resources should be commended."



Fur Seals

FIVE FIRMS SEEK UNITED STATES GOVERNMENT SEALSKIN PROCESSING CONTRACT:

Five firms, one of them in London, England, met the November 1, 1962, deadline for submitting proposals for processing and selling Alaska sealskins for the United States Government, the U. S. Department of the Interior announced on November 5.

The Department stated that no contract will be awarded until the various proposals have been carefully evaluated and that it will be some time in 1963 before negotiation of a new contract can proceed. There are two phases to the evaluation: The first phase relates to the quality of work which the prospective contractor can produce and the second requires proof of his ability to fulfill the requirements of a contract. The U. S. Bureau of Standards will make physical and chemical tests of the sealskins submitted with the pro-

posals. A panel of consultants will also make separate, subjective evaluations. The invitation for proposals to handle the sealskins for the Government follows last winter's announcement that the Department of the Interior was cancelling its contract with the Fouke Fur Company of St. Louis on December 31, 1962. The Fouke Fur Company has processed the skins for many years.

As a basis for a new contract, the Fish and Wildlife Service's Bureau of Commercial Fisheries--the agency charged with managing the Alaska fur seal resource--issued on June 20, 1962, a prospectus for processing and selling these skins. The prospectus listed four steps in the specifications--preliminary processing of the sealskins on the Pribilof Islands, processing the skins from the cured stage to the finished luxury skin, developing the market, and selling the finished skins at public auction. This prospectus was distributed to all interested firms and individuals. Raw skins were supplied to 11 firms and individuals for use in developing an adequate process.

Note: See Commercial Fisheries Review, August 1962 p. 92.



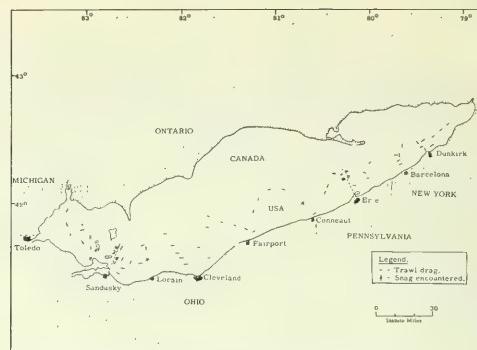
Great Lakes Fisheries

Exploration and Gear Research

TRAWL FISHING INVESTIGATION IN LAKE ERIE:

M/V "Kaho" Cruise 4 (September 23-October 10, 1962): To obtain additional seasonal information concerning the depth and geographic distribution of various fish stocks and their availability to commercial-type bottom trawls were the primary objectives of trawl fishing operations in Lake Erie during this 4-week cruise by the exploratory fishing vessel Kaho of the U. S. Bureau of Commercial Fisheries.

A total of 62 drags was made during this cruise--18, 37, and 7 in the eastern, central, and western basins of Lake Erie. All drags lasted 30 minutes except 2 which snagged on bottom obstructions and 2 that were terminated when sets of trap nets or gill nets were encountered. The two hang-ups caused considerable gear damage. Standard 50-foot (headrope) Gulf of Mexico-type semiballoon trawls equipped with Western-style foot-rope were used.



Lake Erie explorations by M/V Kaho on Cruise 4 (September 23-October 10, 1962.)

Smelt catches of commercial significance were made only in the eastern basin of Lake Erie at depths greater than 75 feet. Three drags off Dunkirk, N. Y., yielded 200, 380, and 490 pounds each; five drags off Barcelona, N. Y., accounted for 150, 300, 450, 480, and 600 pounds each; and off Erie, Pa., three drags yielded 120, 150, and 1,125 pounds each.

Incidental catches during the cruise consisted of 4 catches (115 to 363 pounds) of large yellow perch from 5 fathoms of water in the western basin, 5 catches (95 to 225 pounds) of carp in the central and western basins, and two night catches of (92 pounds each) sheepshead in the central basin. Although fair showings of alewife and gizzard shad were noted in the central and western basins, concentrations available to the bottom trawl were not considered heavy enough to support a fishery.

Young-of-the-year yellow perch were found in heavy concentrations in depths of 11, 12, and 13 fathoms from Erie, Pa., to Vermilion, Ohio. A small-mesh (1-inch stretched measure) cod-end liner accounted for large catches (52 to 1,020 pounds) made in 10 drags. Changing the mesh size was effective in reducing catches of small fish. Young-of-the-year yellow pike were caught in moderate numbers in 12 drags just east and west of the main island group.

Mesh-size selectivity in relation to yellow perch was studied with the aid of a "trouser leg" cod end (a means of fishing two cod ends with different mesh size simultaneously on one net). Although additional data is needed to verify the findings, cod-end mesh sizes of

Lake Erie Trawl Explorations by M/V Kaho During Cruise 4

Area	Depth Range (Feet)	No. of Drags	Catch Rate (Pounds Per Hour)		Species Composition	
			Range	Average	Species	Percentage of catch
Western Basin	21 to 30	7	8 to 1,554	914	Yellow perch (over 8") Yellow perch (4" to 8") Yellow perch (under 4") Carp Alewife Gizzard shad Sheepshead Other species ²	35 21 1/Tr. 18 12 5 5 4
Central Basin	30 to 49	3/8	100 to 950	377	Yellow perch (over 8") Yellow perch (4" to 8") Yellow perch (under 4") Carp Gizzard shad Smelt White bass Other species	8 5 1 33 20 18 7 8
Eastern Basin	50 to 74	4/15	66 to 2,116	645	Yellow perch (over 8") Yellow perch (4" to 8") Yellow perch (under 4") Sheepshead Other species	8 5 70 5 12
	75 to 84	8	40 to 710	198	Yellow perch (over 8") Yellow perch (4" to 8") Yellow perch (under 4") Sheepshead Alewife Other species	31 10 17 31 6 5
	60 to 74	5	52 to 178	94	Yellow perch (over 8") Yellow perch (4" to 8") Yellow perch (Under 4") Smelt Carp Yellow pike (walleye) White bass Alewife Other species	5 Tr. 7 42 20 9 7 6 4
	75 to 99	4	182 to 1,208	707	Yellow perch (over 8") Yellow perch (4" to 8") Yellow perch (under 4") Smelt Other species	1 Tr. 13 85 1
	100 to 124	6	72 to 2,284	946	Yellow perch (all) Smelt Other species	1 98 1
	125 to 149	3	242 to 602	382	Yellow perch (all) Smelt Other species	1 99 0

¹/"Tr." = Less than 0.5 percent.²/"Other species" includes those that individually amounted to less than 5 percent.

3/Four other drags, resulted in gear damage, were stopped to avoid set nets, or otherwise malfunctioned.

4/Two other drags, either resulted in gear damage or were stopped to avoid set nets.

2½-inches and 2¾-inches caught few yellow perch smaller than 8 inches. The 2¼-inch and 1½-inch mesh sizes yielded increasingly greater proportions of younger yellow perch age groups.

Day-night fishing on a 14-fathom drag site off Cleveland yielded better catches at night. The main difference was caused by the presence of 92 pounds of sheepshead in each of two night drags, while comparative daytime drags contained 16 and 17 pounds of that species. Large yellow perch, the only other fish present in significant amounts in

the area, were caught more readily during mid-morning hours.

Surface temperatures ranged from 57° F. to 63° F. in the eastern basin of Lake Erie, 61° F. to 65° F. in the central basin, and 59° F. to 61° F. in the western basin.

Note: See Commercial Fisheries Review, October 1962 p. 15.



Great Lakes Fishery Investigations

LAKE ERIE FISH POPULATION

SURVEY CONTINUED:

M/V "Musky II" (September 1962): The Lake Erie fish population survey was continued in September by the U. S. Bureau of Commercial Fisheries research vessel Musky II. Operations in September included routine fishery and limnological observations at five stations in the western basin of Lake Erie. Two of the stations were visited twice during the month. Also, the vessel made trips to another two areas in the central basin to determine the extent and duration of oxygen deficiencies in deep water. Oxygen deficiencies in those areas were observed for the first time about the latter part of August 1962 in the deeper areas of the central basin off Lorain, Ohio.

Species and sizes of fish caught in bottom trawls were fairly consistent and uniform at different stations. The hauls averaged 821 fish for each 10-minute tow in Sandusky Bay and 765 fish in the open lake. In both the bay and lake, young-of-year fish made up about 85 percent of the catch. Somewhat fewer young white bass and yellow pike were caught than during previous months, probably because of greater escapement related to increase of size.

The growth of most young-of-year fish continued to be mediocre. Average total lengths in inches at the end of September 1962 were: yellow perch, 2.9; yellow pike, 8.6; white bass, 3.2; sheepshead, 4.4; smelt, 2.5; gizzard shad, 3.8; alewife, 4.6; spottail shiner, 2.7; trout-perch, 3.1; and emerald shiner, 2.6.

In mid-September, critically low dissolved oxygen remained in depths over 60 feet at one of the stations off Lorain. Limited numbers of trawl tows, made in conjunction with the water chemistry, yielded few fish as compared to similar tows earlier in 1962 in the same area and depth. The lower numbers of fish and low oxygen appeared to be directly correlated.

Surface water temperatures in the western basin of Lake Erie were 74° F. at the beginning of the month. Strong winds and decreasing air temperatures brought about a rapid and continuous decrease, down to an average of about 60° F. by late September. That change in temperatures was accompa-

nied by an increase in the numbers of smelt in the western portion of the lake.

Commercial landings of yellow perch by Ohio fishermen showed signs of increasing during September. How long the good catches would continue was difficult to estimate because it was not known how long the dominant 1959 year-class of that species would support the fishery. Yellow perch of the 1960 year-class were found to be fewer in number and were growing more slowly than fish of the 1959 year class.

Note: See Commercial Fisheries Review, October 1962 p. 18.

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DREDGE PERFORMANCE TESTED FOR BOTTOM STUDIES IN SOUTHERN LAKE MICHIGAN:

M/V "Cisco" Cruise 8 (September 18-October 1, 1962): A comparison of (1) the performance and relative efficiency of various types of dredges for bottom sampling and (2) the collection of data on the distribution of bottom organisms at different water depths and in different sediments, were the major objectives of this cruise in southern Lake Michigan by the U. S. Bureau of Commercial Fisheries research vessel Cisco. Three samples were taken with each dredge at depths of 3, 10, 20, 30, and 40 fathoms off South Haven and St. Joseph, Mich., and Chicago and Waukegan, Ill. Samples were also taken at 8 fathoms off Racine, Wis. The Racine reef was selected for sampling in order to observe dredge performance in hard clay, gravel, and rock.

Studies conducted on this cruise were originally planned in 1960, when sampling off Grand Haven, Mich., with a Smith-McIntyre dredge (borrowed from the Bureau's Woods Hole Biological Laboratory) and a Petersen dredge showed that the two samplers were not performing equally at depths greater than 20 fathoms. The number of bottom organisms taken by the Petersen dredge decreased as the depth range increased from 20 to 50 fathoms, whereas the number taken by the Smith-McIntyre dredge being tested remained about the same. The orange-peel type dredge was included in the cruise 8 study because much previous sampling in gravel and hard sediments had been with that type of dredge.

A brief examination of the samples collected during the cruise indicated that sediment type at the various depths, rather than

the depth itself, probably determines the sampling efficiency of the dredges.

Bathythermograph casts were made at 1-mile intervals on a transect between Milwaukee, Wis., and Grand Haven, Mich., as part of a study of internal waves in Lake Michigan conducted by the Director of the Scottish Marine Laboratory who was then at the University of Wisconsin.

During the latter part of cruise 8, a large mesh (No. 1558 "Nitex"), 1-meter, nylon plankton net was towed at speeds up to about 7 knots per hour to attempt to collect small fish. One 20-minute oblique tow from the surface down to 4 fathoms, over a 5-fathom bottom, yielded 41 fingerling alewives, but no other fish were caught.

The M/V Cisco was under contract to the U. S. Public Health Service during cruise VII (August 28-September 11). On that cruise, limnological and bacteriological samples were collected at 69 stations at the 1-, 4-, 7-, and 10-mile contours between Milwaukee and Chicago. No report on that cruise will be issued by the Bureau's Ann Arbor Biological Laboratory.

Note: See Commercial Fisheries Review, October 1962 p. 18.

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LAKE TROUT DISTRIBUTION STUDIES IN WESTERN LAKE SUPERIOR CONTINUED:

M/V "Siscowet" Cruise 7 (September 24-October 9, 1962): Environmental conditions were studied at three limnological stations in the Apostle Islands region of Lake Superior during cruise 6 of the research vessel Siscowet (operated by the U. S. Bureau of Commercial Fisheries). Collections included records of water temperatures, Secchi disc readings, water samples for chemical analyses, and bottom and plankton samples. Water temperatures ranged from 50° to 55° F. at the surface, dropped from 55° to 41° F. in the stratum of water between about 10 and 15 fathoms, and were 40° F. at depths of 50 fathoms or more. Plankton abundance was relatively high at all stations.

Trawl tows at depths ranging from 10 to 30 fathoms, and experimental gill nets (1- to 5-inch mesh, by $\frac{1}{2}$ -inch intervals) set at 22 fathoms yielded a total of 269 young lake trout. Of that total, 264 (98 percent) were fin-clipped fish. Nearly all of the lake trout were caught at depths between 20 and 25

fathoms. Lake trout from the 1961 and 1962 Bayfield plants were most common in the catches.

Trawling during and immediately after release of about 16,000 hatchery-reared lake trout from shore at Frog Bay revealed that the fish reached a depth of 10 fathoms in slightly over 1 hour after planting. Earlier observations by the Siscowet on previous cruises showed that lake trout planted in the spring required $2\frac{3}{4}$ hours to reach that depth. The fall-planted fish were larger (8.5 fish to the pound) than those planted in the spring (22 to the pound). This was believed might be the reason for their faster movement to deep water.

In an effort to learn some of the factors which may affect the depth distribution of young lake trout, a $\frac{1}{2}$ -meter plankton net was towed along the bottom at various depths between 10 and 30 fathoms. Zooplankton (predominately copepods), Pontoporeia, and Myysis were most abundant at 20-25 fathoms, but were relatively scarce at depths above 20 and below 25 fathoms.

Chubs (Coregonus hoyi) were common in nearly all the trawl catches. One 15-minute tow at 20 fathoms yielded a total of 711 fish of that species weighing 165 pounds. Other species in the catches included small numbers of smelt, sticklebacks, and sculpins.

Note: See Commercial Fisheries Review, November 1962 p. 24.



Gulf Exploratory Fishery Program

SHRIMP MARKING STUDY IN GULF OF MEXICO:

M/V "George M. Bowers" Cruise 40 (July 6-19 1962): The catching, staining and release of brown shrimp (Penaeus aztecus) was the main objective of this cruise by the gear research vessel M/V George M. Bowers of the U. S. Bureau of Commercial Fisheries. Cruise 40, which was made jointly with the Bureau's Galveston Biological Laboratory, was the initial phase of a continuing study to obtain a preliminary estimate of the growth, mortality and migration patterns of brown shrimp.

The vessel operated in two general areas. In the area off Grand Isle, La., a total of 2,370 shrimp were marked with fast green

dye and released in a depth range of 12 to 17 fathoms. In the other area off the northern Texas coast, some 3,000 shrimp were marked with a Trypan blue dye and released in 4½ to 9 fathoms. Recoveries of marked shrimp from the first release off the Louisiana coast were reported as being very high.

Note: See Commercial Fisheries Review, November 1962 p. 24, and August 1962 p. 26.

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ELECTRICAL FIELD EXPERIMENTS AND SHRIMP BURROWING BEHAVIOR OBSERVATIONS IN GULF OF MEXICO:

M/V "George M. Bowers" Cruise 41:

Electrical field strength experiments and a continuation of studies on the behavior phase of the shrimp gear research project in the Gulf of Mexico were conducted in St. Andrews Bay, Fla. (off Panama City), during this cruise by the U. S. Bureau of Commercial Fisheries gear research vessel George M. Bowers. The vessel operates from the Gulf and South Atlantic Exploration and Gear Research Base at Pascagoula, Miss., where she returned on August 31, 1962.

Electrical Field Strength Experiments: Experiments to determine the shape and magnitude of an a.c. electrical field between two electrodes in sea water were conducted on this cruise. Three sizes of brass electrodes were tested (3' and 6' $\frac{1}{8}$ " rod and 3' $\frac{3}{4}$ " rod). Currents tested were 1 amp, 3 amps and 6 amps. Voltage potentials were measured in predetermined planes surrounding the electrodes with a vacuum-tube voltmeter. In addition, $\frac{3}{32}$ " stainless steel cable electrodes were also tested and the following factors were investigated: (1) The field above the electrodes, (2) the field below the electrodes when they are at an angle to the bottom, (3) the electrodes at right angles, and (4) various frequencies from 60 to 50,000 cycles per second.

Data collected on this trip are being evaluated. An apparent significant increase in voltage drop with an increase in frequency was of interest.

Burrowing Observations: Observations were continued to determine the burrowing behavior of shrimp. During the observation period, the moon was at or near-dark and generally the shrimp remained out of the bottom the entire night. This was in contrast to observations during the full moon when they remained out for only a few hours.

These observations are to be continued using time-lapse cameras and a photometer in an attempt to determine whether light level, moon phase, or both are contributing significantly to this behavior.

Response To Electrical Stimulus: Experiments to evaluate the power level needed to bring about a significant response were undertaken. It was observed that frequently with shrimp in identical positions relative to the electrodes, that a given power level produced a very strong response in some animals but a very weak response in others. Possible reasons for this include: (1) The physiological condition at different molting stages, (2) the physiological condition as a result of trawl capture and tank holding or, (3) a combination of the two.

Instrumentation Development: Performance of instruments on this cruise was as follows:

1. The load cell system was tested on a 40-foot trawl and performed well electrically.
2. The door angle of attack recorder performed well mechanically.
3. The bottom speed indicator functioned well but a magnetic counter was indicated rather than the mechanical one used.
4. The bathykmograph units were tested and found satisfactory.



Gulf Fishery Investigations

Some of the highlights of studies conducted by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries during July-September 1962:

SHRIMP FISHERY PROGRAM: Shrimp Spawning Populations: Brown shrimp ovaries taken off Galveston in 15 and 25 fathoms during January-June 1962 were examined. Comparison between 1961 and 1962 ovary samples shows that a much larger percentage of ripe and recently-spent females occurred in 25 fathoms in 1962. The converse was true for 15-fathom samples. The percentage of ripe and recently spent ovaries from 15 fathoms was much greater in 1961. A large proportion of the brown shrimp females from 15 fathoms in 1962

were young with ovaries either undeveloped or in early developmental stages.

During July-September 1962, six research cruises were completed in which 175 one-hour hauls were made with a 45-foot flat shrimp trawl.

There were 35,905 penaeid shrimp taken, of which 12,857 or 35 percent were commercial species. About one-third of the catch consisted of rock shrimp (*Sicyonia brevirostris*), a species not now exploited. The catch per unit of effort for adults of all species increased with an increase in longitude in much the same manner as the penaeid larvae.

Migrations of Brown and White Shrimp: Of the 2,431 stained and 1,690 tagged shrimp released off the Texas coast in April 1962, 144 stained shrimp and 61 tagged shrimp had been recovered by the end of the third quarter 1962.

The movement of the stained shrimp was random in relation to the Texas coast and more than 92 percent of the recoveries were captured less than 30 miles from the center of the staining area. Tagged shrimp slightly northeast of Port Aransas moved in a southerly direction, while shrimp released south of Port Aransas moved mostly in a northerly direction. One shrimp traveled about 68 miles in a northeasterly direction. None of the tagged shrimp released off Freeport traveled more than 15 miles. The data indicate no significant immigration of large adult shrimp from adjacent areas into the staining area, nor any significant emigration of shrimp from the staining area into adjacent areas.

Two mark-recapture experiments designed to obtain estimates of fishing mortality and other parameters on the brown shrimp stocks were initiated during July 1962. A total of 2,370 stained shrimp, including three different size groups, was released off Grand Isle, Louisiana, and 2,973 stained shrimp of two different size groups was released off Galveston, Tex. In addition, a preliminary estimate of the number of nonrecoveries was obtained for the Golden Meadow-Grand Isle area during July. A total of 623 shrimp had been recovered by the end of the third quarter from the Louisiana experiment, and 69 recoveries had been returned from the Galveston experiment.

During the quarter, 72 stains, pigments, and fluorescent dyes were tested to determine their suitability as primary or secondary marking agents on penaeid shrimp. Two of the stains, Bates numbering inks blue and green, tested as primary marks retained sufficient color in the gills to be considered useful as marking agents for short-term experiments.

The movement of Sanford's checkwriter inks, red, blue, and black, from the site of injection into the gill area where they mask the primary stain definitely limits the suitability of those inks as secondary marks.

A number of fluorescent pigments used as secondary marks have proved successful when used with the primary stain, fast green FCF. These pigments are easily detected and differentiated under ultraviolet light. No fading or shedding was observed at the end of 84 days. Since those pigments can be localized at the site of injection, the number of secondary marks can be increased by varying the injection site.

Bait Shrimp Fishery: Bait shrimp production in the Galveston Bay system increased in July and August 1962 as compared with the same months of 1961. However, species composition percentages indicate that juvenile brown shrimp left the Bay earlier this year than in 1961. Substantial offshore catches of brown shrimp too small to meet the required 50 count (heads-off) per pound in July, August, and the first part of September would seem to support this conclusion.

Shrimp Larval Studies: During the quarter 222 plankton samples were examined for penaeid larvae. These were collected during January-April 1962 at the 60 monthly stations between the Mississippi River and Brownsville, Texas. The data show that the relative abundance of penaeid larvae increased with an increase in longitude, i.e. moving east to west. Statistical areas 13-15 had a relatively low larval abundance. In areas 16-18 penaeid larvae were slightly more abundant and were found to be most abundant in statistical areas 19-21.

In all statistical areas penaeid larvae were more abundant in the 20-40 and 40-60 fathom depth zones than in the 0-20 fathom zone.

Larval stages consisted primarily of protozoaea, mysis, and postlarva. Very few

nauplius stage shrimp were taken, an indication that spawning activity was reduced during January-April 1962.

Commercial Catch Sampling: It was reported by fishermen in July and August 1962 that large quantities of undersized shrimp (Texas law) were being discarded at sea. In mid-August a 10-day trip was made on a commercial shrimp boat to make observations on the amount of discard relative to the amount of shrimp retained. Culling ranged from 0 to 64 percent of each haul with 74 percent of the total catch being marketable. According to the captain of the boat this was an improvement over the preceding month when up to 75 percent of the catch was discarded because of size.

Measurements of tail and total length and conversion charts were completed for brown and white shrimp.

The landings of 387 vessels were sampled for size and species composition. In this work nearly 40,000 shrimp were examined of which 84 percent were brown shrimp, 14 percent white shrimp, and 2 percent pink shrimp.

Migrations of Pink Shrimp: A mark and recapture experiment designed to give additional information on the geographic distribution of the Tortugas shrimp population was initiated near Indian Key, Fla. Between August 27 and September 5, 1962, a total of 19,860 pink shrimp were marked with trypan blue and released.

Two pink shrimp marked on the Sanibel grounds in March 1962 were recovered near the northwest border of the Tortugas grounds. They had traveled about 82 nautical miles in 115 days. These recoveries were the first indication of movement between the two fishing grounds. No Tortugas marked shrimp have been taken on the Sanibel grounds.

The returns from the Sanibel experiment are complete with 563 (22 percent) of the 2,496 marked shrimp having been returned as of September 21, 1962. Growth data from this experiment indicate an average increment of 2.4 mm. per month for females and 1.3 mm. per month for males.

Study of the relative abundance and distribution of larvae of the pink shrimp (Penaeus duorarum) on the Tortugas Shelf of

the Gulf of Mexico was continued by the Institute of Marine Science University of Miami, under a contract with the U. S. Fish and Wildlife Service.

Plankton collecting trips were made to the Tortugas Shelf (4) and to Buttonwood Canal (4) using a Gulf V plankton sampler in the former area and a plankton pump in the latter. Considerable time during the quarter was occupied with purchasing and assembling equipment for the year's work.

During the quarter pink shrimp were twice reared from egg to postlarvae in the laboratory. The successful rearing through metamorphosis confirms earlier conclusions regarding pink shrimp development, which were partly based on stages of larvae found in the plankton.

BEHAVIOR PROGRAM: Effect of Temperature and Salinity on Growth and Survival of Estuarine Species: The acquisition of automatic temperature recording equipment has made it possible to study the behavior of small shrimp in vertical temperature gradients. Although the experimental apparatus employed was identical to that used in testing shrimp responses to salinity gradients (previously reported), the results obtained were strikingly different. While shrimp demonstrated a marked behavioral response to salinity gradients (avoiding salinities above 35 parts per thousand), most of these animals have been found to be incapable of avoiding lethal low temperatures in temperature gradients. Thus 32 of 37 shrimp tested became immobilized through cold narcosis before the end of the 25-min-ute observation period.

While it is too early to postulate the relative ecological significance of salinity and temperature to small shrimp, the present findings show that under comparable conditions these animals are more responsive in terms of linear movement to salinity than to temperature.

Results of a 24-hour survival study of shrimp grown from postlarval to juvenile size strongly support our previously reported suggestion that juvenile (1½-inch total length) brown shrimp can tolerate considerable changes in temperature and salinity. The over-all survival was excellent (95 percent). The high level of survival in this experiment becomes even more

striking when we note that the temperature and salinity changes were immediate, providing the animals no opportunity for gradual acclimation.

ESTUARINE PROGRAM: Ecology of Western Gulf Estuaries: Analysis of 5 years of hydrological, meteorological, and biological data from the Galveston Bay estuarine system has been initiated. Analysis will include a comparison of the relative value to the fishery of four separate areas within the system.

Field sampling in the Galveston Bay system has been temporarily reduced in scope pending a preliminary review and examination of results from the past 5 years. A modified field program is being developed that will supplement and enhance the previous work.

Effects of Engineering Projects: During the quarter, 36 appraisals were made of engineering projects potentially affecting Texas estuarine fishery resources under the present system of coordination with the Branch of River Basin Studies. The majority of these resulted from the more than 109 Corps of Engineers public notices and letters received during the quarter and screened to determine which projects could materially affect estuarine areas, and consequently marine fishery resources. Portions pertaining to these fishery resources in 13 Bureau of Sport Fisheries and Wildlife draft reports were reviewed for concurrence or recommendations.

INDUSTRIAL FISHERY PROGRAM: Preliminary analysis of fish samples collected from waters off the Texas and Louisiana coasts from January through August 1962 had been completed by the end of the third quarter. Consistent trends can be seen in both the distribution and abundance of major species in spite of the fact that a relatively small number of samples are used to characterize this wide geographic area (monthly 5-lb. samples from each of 60 stations). No adequate measure of the absolute abundance of fish is available but, in general terms, it can be said that biomass appears to decrease as one proceeds westward from the Mississippi Delta or from the shoreline toward deeper waters. For the most part, these changes in biomass can be attributed to the distribution of individual species. A series of curves which relate the relative abundance of a species with

depth or distance from shore have been constructed. These, when used in conjunction with a measure of the contribution to the total catch made by each species, provide an approximate description of abundance.

Variation in the species composition of trawl catches taken from a given area has been recognized in the literature by several authors. This type of variation is sometimes extreme, i.e., a particular species may either dominate or be virtually absent from trawl hauls made in the same locale. Clarification of such marked variation is necessary before either sampling data or commercial statistics can be related to the actual fish stocks available in an area. A first step in this direction was made during a cruise in June when stations were sampled at 3-hour intervals over 24-hour periods. Information gained at that time indicated that the greatest single source of variation was associated with the diurnal periods of activity of the species involved. Several species, heretofore considered to be demersal, were found to be liable to capture by the trawl during approximately half of each 24-hour period. A second, more extensive, cruise which will employ both bottom and midwater trawls is planned in order to investigate this question more thoroughly. Since several other sources of variation may tend to mask the results of the field program, the question will also be pursued under laboratory conditions. An outdoor tank, measuring 18 feet in diameter and 16 feet in depth, has been fitted with a total of 10 portholes at various depths. It is expected that an observer situated outside the tank will be able to photograph or otherwise record the relative position of each species of fish over 24-hour periods.

The industrial trawl fishery in the northern Gulf is composed of two distinct fleets. Vessels in the East Gulf fleet fish east of the Mississippi River Delta from Pass a Loutre, La., to Gulf Shores, Ala., are usually less than 60 feet in length, and have an average capacity of about 30 tons. The West Gulf fleet generally fishes west of the Delta from Southwest Pass to Ship Shoal, La., and is made up of vessels more than 60 feet long with an average capacity of about 90 tons.

Relative fishing effort between the two fleets was calculated from 363 trips between April and September 1962. About 93

percent of the effort by both fleets occurred within the 10-fathom curve. The most concentrated efforts by vessels of the East Gulf took place in an area of about 300 square miles east of the entrance to Mobile Bay, Ala. Grounds of most importance to the West Gulf fleet lay immediately off Barataria Bay, Timbalier Bay, and Terrebonne Bay, occupying about 400 square miles of Louisiana coastal waters.

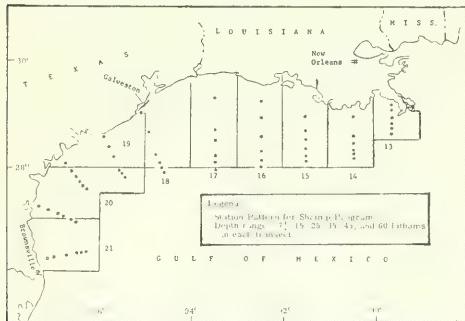
Work continues on collecting and reading scales and otoliths of Atlantic croaker, spot, and sand sea trout.

Note: See Commercial Fisheries Review, June 1962 p. 19.

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SHRIMP DISTRIBUTION STUDIES:

M/V "Belle of Texas" Cruise BT-29 (October 16-27, 1962): Four statistical areas were covered on this cruise by the research vessel Belle of Texas, and a 45-foot shrimp trawl was used. One 3-hour tow was made in each of the 3 depth ranges in each area. The vessel (operated by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries in studying the distribution of shrimp in the Gulf of Mexico) returned to her home port on October 27.



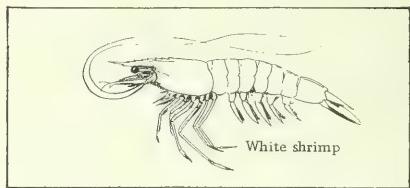
Catches of brown shrimp were very small at all depths except 0-20 fathoms in areas 18 and 19. The largest total catch of any area was in area 21 which yielded about 28 pounds, most of it large brown shrimp counting 12-15 to the pound from 20-40 fathoms. Catches in other depths of that area were small, and included a scattering of white and pink shrimp.

A total catch of about 20 pounds from area 20 was made up of 12 pounds of 21-25 count brown shrimp from the 20-40 fathom depth, and 6 pounds of 31-40 count brown shrimp from 0-20 fathoms. A small amount of 12-15 count brown shrimp and some 21-25 count white shrimp were also caught in that area.

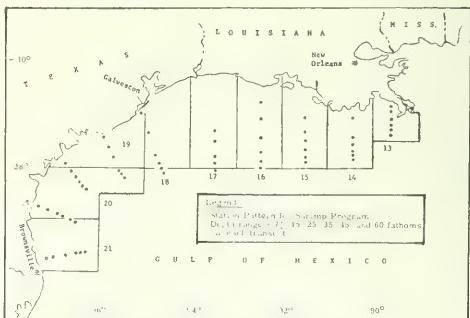
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M/V "Belle of Texas" Cruise BT-30 (October 27-30, 1962): Shrimp catches were relatively good in 2 of the 4 statistical areas worked by the Belle of Texas during this 4-day cruise. A 45-foot shrimp trawl was used, and one 3-hour tow was made in each of the 3 depth ranges.

Areas 16 and 17 yielded an average of 40 pounds each, mostly large brown shrimp counting 9-20 to the pound. A total of 16 pounds of smaller brown shrimp counting 26-30 were caught at 0-20 fathoms in area 16.



In area 14, shrimp counting 31-40 to the pound were caught at 0-20 fathoms--11 pounds were white shrimp and 6 pounds brown shrimp. Brown shrimp caught at other depths in that area counted 12-15 to the pound.



Area 15 accounted for 25 pounds of brown shrimp ranging from 21-30 count caught at depths up to 40 fathoms, and a small amount of larger shrimp from deeper water.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.
 (2) See Commercial Fisheries Review, November 1962 p. 26.



Industrial Fishery Products

FISH MEAL, OIL, AND SOLUBLES:

U. S. Production, September 1962: Preliminary data on U. S. production of fish meal, oil, and solubles for September 1962

U. S. Production ¹ / of Fish Meal, Oil, and Solubles, September 1962 (Preliminary) with Comparisons				
Area	Meal	Oil	Solubles	Homog- enized ³
September 1962:		Short Tons	1,000 Gallons	.. (Short Tons) ..
East & Gulf Coasts .	29,808	3,902	11,088	-
West Coast ² / . . .	2,090	70	1,532	-
Total	31,898	3,972	12,620	-
Jan.-Sept. 1962 Tot.	239,840	26,220	50,843	6,570
Jan.-Sept. 1961 Tot.	248,645	28,620	82,071	9,532

¹/Does not include crab meal, shrimp meal, and liver oils.

²/Includes Hawaii, American Samoa, and Puerto Rico.

³/Includes condensed fish.

as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in table 1.

During September 1962, a total of 31,200 tons of fish meal and scrap and 4 million gallons of marine-animal oils were produced in the United States. Compared with September 1961, this was an increase of 2,400 tons or 8 percent in meal and scrap production and 608,000 gallons or 18 percent in oil.

Menhaden meal amounted to 27,200 tons--accounting for 87 percent of the September 1962 meal total. Oil from menhaden (3.7 million gallons) comprised 94 percent of the September 1962 oil production.

There were 12,000 tons of fish solubles produced in September 1962--1,500 tons above the same month of the previous year. There was no homogenized condensed fish produced in September 1962 as compared with 710 tons in the same month of 1961.

During the first 9 months of 1962, meal and scrap production totaled 238,300 tons--13,900 tons below the same period of 1961. The marine animal oil yield totaled 26.3.

Table 2 - U.S. Production of Fish Meal, Oil, and Solubles, September 1962, with Comparisons

Product	September		Jan.-Sept.		Total	
	1/1962	1961	1/1962	1961		
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Fish Meal and Scrap:			(Short Tons)			
Herring	424	525	3,051	4,987	5,268	
Menchaden 2/	27,217	24,914	202,866	218,091	247,551	
Sardine, Pacific	8	688	714	688	2,518	
Tuna and mackerel	1,368	1,958	15,096	15,416	21,243	
Unclassified	2,248	715	16,613	13,092	14,757	
Total	31,165	28,800	238,340	252,274	291,337	
Shellfish, marine-animal meal and scrap	3/	3/	3/	3/	19,928	
Grand total meal and scrap	3/	3/	3/	3/	311,265	
Fish solubles	12,009	10,522	93,023	84,299	100,551	
Homogenized condensed fish	-	710	8,065	9,407	11,690	
Oil, body:			(Gallons)			
Herring	82,455	164,017	610,180	801,547	818,017	
Menchaden 2/	3,733,844	2,963,935	24,495,198	27,024,984	31,355,570	
Sardine, Pacific	755	22,851	21,239	22,851	86,167	
Tuna and mackerel	60,223	109,968	463,022	485,145	762,509	
Other (including whale)	87,037	95,741	695,831	1,141,940	1,386,542	
Total oil	3,964,314	3,356,512	26,285,470	29,476,467	34,408,805	

¹/Preliminary data.

²/Includes a small quantity produced from thread herring.

³/Not available on a monthly basis.

Table 3 - U.S. Foreign Trade in Selected Industrial Products, August and September 1962 with Comparisons

Product	August		September		Jan.-Sept.		Total
	1/1962	1961	1/1962	1961	1/1962	1961	1961
Imports:	(Short Tons)						
Fish meal & scrap	28,253	19,026	13,698	13,941	208,694	159,503	217,845
Fish solubles	422	318	178	263	5,196	2,508	6,739
Whale oil, sperm (crude and refined)	-	717,855	462,576	293,081	4,740,749	4,938,798	7,807,625
Exports:	(Gallons)						
Fish & fish-liver oils	33,271,765	13,304,278	219,241	9,521,370	96,624,014	95,374,843	122,485,721
Whale and sperm oil	6,892	-	30,300	6,826	1,972,811	169,952	1,205,674

1/Preliminary data.

million gallons--a drop of 3.2 million gallons as compared with the same period in 1961.

Imports and Exports: Imports of fish meal during January-September 1962 (208,700 tons) were 49,200 tons above the same period in 1961, and imports of fish solubles (5,200 tons) were up 2,700 tons. Exports of fish and fish-liver oils amounted to 96.6 million pounds (129 million gallons) during the first 9 months of 1962--up 1.2 million pounds (166,600 gallons) compared with the same period in 1961.

* * * * *

HOW MUCH FISH MEAL SHOULD BROILER RATIONS CONTAIN FOR BEST RESULTS?

The question of how much fish meal is enough in an otherwise all vegetable ration for broilers is, in part, answered by research on the subject. Levels of 7- and 10.5-percent fish meal in rations yielded significantly greater weight gains in broilers than did a 3.5-percent fish meal level. These were the results of experiments at the Mississippi State University carried out with broilers fed rations having nearly equal amounts of protein.

The two higher levels of 7- and 10.5-percent fish meal also increased efficiency of feed utilization (pounds of feed per pound of gain) when added to corn-soybean oil meal rations. Results obtained with the two higher levels of fish meal were not significantly different. These results indicate that as far as the fish growth factor of UGF (unidentified growth factor) is concerned, a 3.5-percent level of fish meal is not enough whereas a 7-percent level is sufficient. Where

neither 3.5-percent fish meal nor 4-percent condensed fish solubles as the only source of animal protein in a ration was adequate for maximum growth and feed efficiency, excellent results were obtained with 3.5-percent fish meal plus 4-percent fish solubles.

Broiler rations containing 7-percent fish meal were not improved by the addition of methionine (an amino acid or protein constituent), showing that this level of fish meal supplies all the methionine that is required. In addition, the efficiency of feed utilization was about the same at relatively high and low levels of protein intake when as much as 7-percent of the ration consisted of fish meal. But this was not true with only 3.5-percent fish meal. This means that 7-percent fish meal in a corn-soybean oil meal ration fully supplies the required amounts of methionine and other necessary amino acids. Raising the fish meal level to 10.5 percent did not further improve the ration.

According to research reported by nutritionists in the July issue of *Poultry Science*, a 7-percent fish meal level is enough in an otherwise all vegetable broiler ration. *Poultry Science* is the official journal of the *Poultry Science Association*.

* * * * *

MORE FISH MEAL AND OIL IN ANIMAL MIXED FEEDS ENCOURAGED:

The Midwest represents a good potential market for the additional use of fish meal in noncritical rations where only very small amounts are used primarily so that the meal can be mentioned on the tag. This was the opinion of a U. S. Bureau of Commercial Fisheries animal nutritionist after a trip to

Illinois and Missouri to encourage the use of more fish meal in mixed feeds, and to determine possible ways in which more fish oil can be utilized in animal feeding.

Fish meal is generally used in Illinois in critical rations such as breeder, turkey starter, and broiler rations, despite the added transportation charges that increase costs of industrial fishery products in the Midwest.

There is only a limited demand at this time for stabilized fish oil for use in poultry feeds. Eventually, uses may be found for the oil in feeds other than poultry feeds. In order to increase the demand for fish oil, quality should be improved, and definite efforts should be made to:

1. Produce a uniform and dependable product.
2. Stabilize the oil.
3. Determine how fish oil can best be marketed. (As pure fish oil? As a blend? As a partially hydrogenated fat?)

A long-range point of view suggests that research should be carried out to determine uses of fish oil in animal nutrition, in addition to those already known.

At the Annual Convention of the National Feed Ingredients Association, held September 12-14, 1962, at Chicago, a motion picture produced by Successful Farming, "Farming's New Face," was shown. The basic idea conveyed by the picture is that with the formation, now taking place in the United States, of relatively large farm units from several small farms, profits to farm operators have increased. As a result of increased profits, such operators are now potentially better customers of feed and other supplies than they were formally.

In the sectional meetings of the Chicago Convention, both the "feed manufacturers" and the "specialty ingredients" groups seemed mainly concerned with Food and Drug Administration (FDA) restrictions on labeling. When feed producers wish to add a new drug to their feed line, they need permission from FDA under certain conditions but not under others. In general, if the additive is supposed to have a therapeutic effect (medicine), permission is needed. If the additive is considered a nutrient only, then permission from FDA is not needed.

A great deal of interest in trace minerals in nutrition was in evidence at the Convention meetings. The known diseases related to trace mineral deficiencies were described. Processors of salt and other minerals were represented by specialists on the program who pointed out the values of their products in preventing deficiencies.



Inventions

NEW OUTBOARD MOTOR TILTING DEVICE PATENTED:

The inventor of an outboard motor tilting device claims his device allows a person in any part of a small boat to lift the motor easily. He claims the device is very useful when the motor is stuck in sand or mud. It consists of an elongated rod which is attached in an upright position to the forward tilting handle of an outboard motor. A cable is attached to the top of the rod and then looped about the rear tilting handle of the motor. To tilt the motor, the top of the elongated rod is pulled forward. The device is simple, inexpensive, and easily attached and detached. (Patent Number 2,979,017, U. S. Patent Office Classification Number 115-17, granted April 11, 1961, to Donald H. Soper, 1015 L Avenue, Nevada, Iowa.)

* * * * *

NEW FISH LURE PATENTED:

The inventor of a new fish lure claims his lure is long-lasting and creates the impression of a swimming fish by the use of multi-colored mirrors which rotate within sealed watertight transparent plastic tubing. The lure turns freely on a metal shaft. Angular fins on the outside create a rotary movement. (Patent Number 3,031,796, U. S. Patent Office Classification Number 43-42.2, granted May 1, 1962, to Carl Ellis Swenson, 9 Magnolia Street, Bergenfield, N. J.)

* * * * *

NEW LIFEBOAT LAUNCHING DEVICE PATENTED:

The inventor of a new lifeboat launching device claims his device can be used for launching lifeboats or rafts even if a ship is tilted or has its port holes open. The device consists of a metal carriage and cradle. The carriage has 8 wheels which go over a ship's port holes. The cradle sits in the carriage

on a pivot which holds the lifeboat at even keel at all times. The lifeboat is ready for launching by one man at all times and is automatically released once it is in the water. (Patent Number 3,032,786, U. S. Patent Office Classification Number 9-41, granted May 8, 1962, to Frank and Russell W. Hudson, Box 411, Line Road, Manorville, L. I., N. Y.)



Massachusetts

NEW MARINE FISHERIES ADVISORY COMMISSION:

The purpose of the new Massachusetts marine fisheries law (Chapter 715) which became effective July 23, 1962, was to immediately bring about the orderly and co-ordinated activities of the Massachusetts marine fisheries and all related activities. The law as amended provided for a Marine Fisheries Advisory Commission composed of 9 members within the Division of Marine Fisheries. All 9 members appointed by the Governor of Massachusetts were confirmed by The Governor's Executive Council by the end of October 1962.

The members of the new Commission are given considerable latitude in using their experience, knowledge, and ideas for the benefit of the Commonwealth of Massachusetts in the field of marine fisheries. Under the law, meetings must be held at least quarterly, but opinions were that more than 4 meetings a year would be held, with perhaps as many as 10 a year, according to one suggestion.

The Director of the Massachusetts Division of Marine Fisheries said he was certain the new Commission would be a great help to the State. He stated that when fisheries matters come up in the future, point of view of various interests can be expressed through the Commission, instead of having hundreds of persons forced to give up a day's work in order to attend meetings.

Commission members pointed out that there were numerous problems to be resolved but that none was yet singled out for priority. There was a possibility of early consideration to the question of how to regulate tuna fishing, bearing in mind the interests of both sport fishermen and commer-

cial fishermen. Zoning of certain waters for one or the other interests also was proposed.

It appeared that the Commission would not immediately consider the spending of additional money for the benefit of the fisheries. Funds were expected to be available in the coming year, with a quarter of a million dollars estimated as potentially available from the State tax on fuel consumed by boats.

Members of the new Commission include a cross-section of well known persons in the Massachusetts commercial and sport fisheries, and related industries.

Note: See Commercial Fisheries Review, September 1962 p. 34.



Michigan

LAKE TROUT PLANTED IN SIX LAKES:

Michigan's late fall lake trout planting program called for some 32,500 lake trout to be released for restocking six lakes in the northern peninsula, announced the Michigan Department of Conservation on November 1, 1962.

A total of 5,000 lake trout were released in Big Glen Lake, Leelanau County, during the latter part of October. Other lakes scheduled for lake trout restocking early in November were: Higgins Lake, Roscommon County, 10,000 fish; Elk and Torch Lakes, Antrim County, 5,000 each; Walloon Lake, Emmett County, 5,000; Lake Avalon, Montmorency County, 2,500.

The plantings were made at dusk when sea-gulls have less chance of preying on the fish before they take to deep water. Releases consisted of 2-year-old lake trout measuring 7 inches and longer.

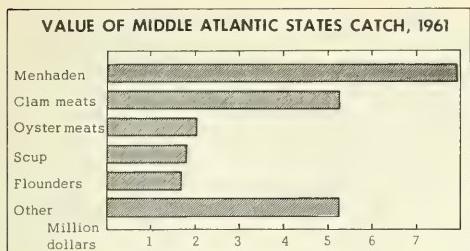
About 5,000 lake trout were planted in Crystal Lake, Benzie County, in the spring of 1962, as part of Michigan's Department of Conservation 1962 lake trout planting program.



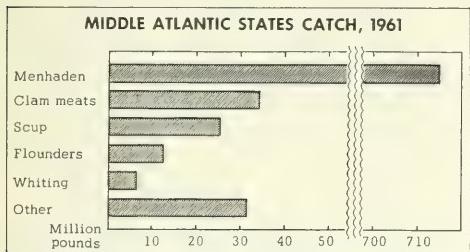
Middle Atlantic States

FISHERY LANDINGS, 1961:

Landings of fish and shellfish in the Middle Atlantic States (New York, New Jersey,



and Delaware) during 1961, totaled 825 million pounds valued at \$24 million ex-vessel. Landings (up 41.6 million pounds over 1960) were the highest since 1957. The value was more than \$2 million over the previous year. Increased catches of menhaden largely accounted for the gain in volume. The higher value was mainly the result of improved prices received for menhaden and oysters.



New Jersey, with 397 million pounds, accounted for 48 percent of the catch, followed by Delaware with 37 percent. New

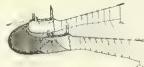


Boxing and icing butterfish from vessel at Fulton Fish Market, New York City.

Jersey also led in ex-vessel value with \$11 million or 46 percent of the total; New York was second with 38 percent.

There were 8,559 fishermen engaged in the Middle Atlantic fisheries in 1961--227 more than in 1960. This increase took place in the shore and boat fisheries; fewer men fished aboard vessels. Fishing craft operated in the Middle Atlantic area during the year consisted of 602 vessels (31,159 gross tons), 3,676 motorboats, and 447 other boats.

Manufactured fishery products of the Middle Atlantic area in 1961 amounted to \$91.8 million--an increase of \$11.4 million over the previous year. Increased production of breaded fresh or frozen fish, canned fish and shellfish, smoked and kippered fish, and industrial products largely accounted for the gain.



Missouri

FISHERIES RESEARCH UNIT FOR MISSOURI UNIVERSITY:

The Missouri Conservation Commission, the U. S. Fish and Wildlife Service, and the University of Missouri will cooperate in establishing a fisheries research unit at the university. It will be the third such unit in the nation.

The research unit will be staffed by two employees of the Fish and Wildlife Service and will have its facilities in the wildlife building, Stephens Hall, on the university's campus. The work will include research, teaching, extension, and fish resource surveys.

With the university furnishing the quarters, the Conservation Commission will furnish \$10,000 and the Fish and Wildlife Service will furnish \$30,000. Of the Federal appropriation, \$3,000 will be used for administration at the regional and national level and \$27,000 will come into Missouri.

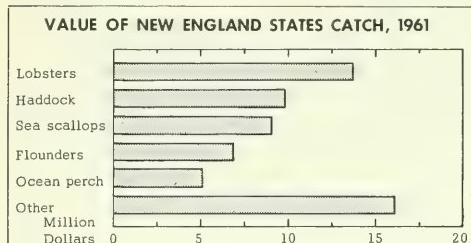
The unit is expected to go into operation this fall after a unit leader is selected, according to an October 12, 1962, news release from the Conservation Commission.



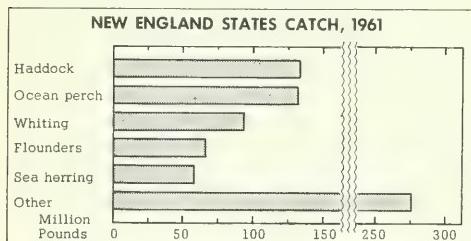
New England

FISHERIES, 1961:

Fish and shellfish landings in the New England States (Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut) during 1961 amounted to 760 million pounds valued at \$60.9 million ex-vessel. The 1961 catch was 92 million pounds less than in the previous year and the smallest in that region since 1944. The value fell \$616,000 below the 1960 level.



Only one State--Rhode Island--gained in volume over 1961. This increase of nearly 15 million pounds resulted from larger landings of fish taken for industrial purposes.



The 1961 decline in volume was due chiefly to greatly reduced landings of Maine sea herring. Total landings of that species fell from 155 million pounds in 1960 to 58 million pounds--the lowest yield since 1940. The value decreased more than \$1 million ex-vessel. Landings of menhaden were down almost 17 million pounds; whiting, down 10 million pounds; ocean perch, down 9 million pounds; and lobsters, down over 3 million pounds. There were moderate increases in the catches of haddock, scup, cod, flounders, alewives, and species taken for industrial use. Sea scallop landings of 23.8 million pounds (mostly at New Bedford, Mass.), exceeded the 1960 record yield of 22.5 million pounds.

There were 21,737 fishermen engaged in the New England fisheries in 1961--about 463 less than in the previous year. Fishing craft in the New England area during the year consisted of 738 vessels (44,242 gross tons), 11,155 motor boats, and 709 other boats.

Manufactured fishery products of the New England area in 1961 were valued at \$107.8 million--a decrease of \$8.9 million compared with the previous year. A decline in the canned pack of Maine sardines largely accounted for the drop.



Ohio River Basin

WATER QUALITY MANAGEMENT

PLAN FOR UPPER OHIO RIVER BASIN:

A six-year water quality management plan for the upper Ohio River Basin was announced on October 31, 1962, by the Secretary of Health, Education, and Welfare.

The comprehensive water pollution control program will be conducted by the Public Health Service's Division of Water Supply and Pollution Control in cooperation with states, communities, and industries of the basin.

Wheeling, W. Va., has been selected as project headquarters for the initial studies which are to be in the area drained by the Allegheny, Monongahela, Beaver, Muskingum, Hocking, Kanawha Rivers, and the Ohio River itself upstream from the mouth of the Kanawha River.

Acid mine drainage is probably the greatest single pollution problem in the basin and constitutes the greatest unknown factor with respect to satisfactory and economical means for pollution control and abatement.

The object of the study is to assure the Ohio River Basin of high quality water which will help improve the economy and recreational facilities of the area and protect the public health.

At its peak of activity a staff of 40 to 50 engineers, chemists, biologists, and other scientific and supporting personnel will be required to collect and evaluate the plan's engineering and laboratory data.



Salmon

INTERIOR DEPARTMENT TO INTERVENE IN NEW DON PEDRO (CALIF.) RESERVOIR PROJECT HEARING:

To safeguard an average annual run of about 40,000 chinook salmon in California's Tuolumne River, the U. S. Department of the Interior announced its intention to intervene in a Federal Power Commission hearing on a license application for the proposed Don Pedro dam and reservoir project near La Grange, Calif.

The salmon are an important interstate and international fishery resource, supporting sport and commercial fisheries, not only in California waters, but also in the Pacific Ocean off the coasts of Oregon, Washington, British Columbia and, probably southern Alaska, the Department said.

Studies by the Department's Fish and Wildlife Service indicate that the new Don Pedro project, as proposed, would jeopardize the fish runs unless minimum flows downstream are guaranteed by the license applicants, the Turlock and Modesto Irrigation Districts. The project, in addition to producing hydroelectric power, will supply municipal water to the City of San Francisco for marketing to localities and communities outside the city.

The application for a license to construct the dam was filed with the Federal Power Commission over a year ago. Since then, the California Department of Fish and Game and the Fish and Wildlife Service have held discussions with the applicants to try and reach a compromise that would allow the project to be constructed and still maintain the valuable fishery. This fishery annually produces about one million pounds of commercial salmon and provides 36,000 man-days of sport fishing.

Under the terms requested in the application by the irrigation districts it would be possible to remove all the water from the Tuolumne River in dry years.

Negotiators from the California Fish and Game Department, the City and County of San Francisco, and the irrigation districts drafted a proposed agreement on the problem subject to ratification by their governing bodies. This agreement, however, was rejected as inadequate by the California Fish and Game Commission at its meeting July

20, 1962. Following this rejection, the Federal Power Commission scheduled a hearing on the project for October 16, 1962, in San Francisco.

The Interior Department has now started action to intervene formally in the case and to participate in the hearing in order to present license conditions to protect adequately the fishery resources of the Tuolumne River.



Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS, OCTOBER 1962:

Item and Period	1962	1961	1960	1959	1958
(1,000 Lbs., Heads-Off)					
Total landings, So. Atl. and Gulf States:					
December	-	6,538	7,097	8,716	8,099
November	-	9,996	14,454	12,412	12,416
October	13,000	12,696	21,690	19,602	16,461
January-September	69,280	62,165	97,794	89,929	79,576
January-December	-	91,395	141,035	130,659	116,552
Quantity canned, Gulf States 1/:					
December	-	800	977	1,278	1,943
November	-	2,215	1,614	2,312	3,424
October	3,900	2,310	2,567	2,531	3,489
January-September	15,154	10,438	23,436	18,558	17,548
January-December	-	15,763	28,594	24,679	26,404
Frozen inventories (as of end of each mo.) 2/:					
December 31	-	19,755	40,913	37,866	32,844
November 30	-	20,668	37,264	37,334	30,211
October 31	18,944	17,811	31,209	33,057	24,620
September 30	14,111	13,361	24,492	26,119	18,079
August 31	12,754	12,728	20,171	23,780	15,274
July 31	13,677	14,849	17,397	22,352	12,351
February 28	19,012	37,612	29,063	27,555	16,359
Imports 3/:					
December	-	15,442	12,411	10,611	10,448
November	-	14,852	13,516	10,269	10,617
October	4/	16,813	14,211	15,340	11,463
September	9,696	8,628	8,190	7,541	7,620
January-August	78,647	70,546	65,090	62,794	45,246
January-December	-	126,282	113,418	106,555	85,394
... (¢/lb., 26-30 Count, Heads-Off) ...					
Ex-vessel price, all species So. Atl. and Gulf Ports:					
December	-	75.2	54.2	48.4	70.8
November	-	73.5	54.0	49.2	69.0
October	5/96.0	68.7	53.0	49.4	66.4
September	5/95.0	70.1	52.2	46.4	65.6
August	5/93.0	66.1	52.0	46.9	70.8
July	5/90.0	55.8	54.6	49.2	72.6
January-June	81.0	53.8	56.7	66.5	74.9
Wholesale price for froz. domestic brown species (5-lb. pkgs.) at Chicago, Ill.:					
December	-	91-92	68-70	64-66	87-89
November	-	89-92	69-73	60-65	83-87
October	111-115	83-90	69-73	59-62	80-84
September	113-118	87-90	65-70	62-64	78-84
August	110-112	76-91	64-67	62-64	81-86
July	-	70-75	72-77	62-74	90-93
January-June	91-104	67-72	64-77	70-88	81-98
Pounds of headless shrimp determined by multiplying the number of standard cases by 33.					
2/Raw headless only; excludes breaded, peeled and deveined, etc.					
3/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the National Marine Censuses.					
4/Not Available.					
5/Estimated.					
Notes: Data for 1962 and 1961 are preliminary. October 1962 data estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.					



Tuna

PACK IN UNITED STATES AND TERRITORIES IN 1962 AT RECORD HIGH:

As of November 1 for the United States west coast and as of October 1 for Hawaii, American Samoa, and Puerto Rico, this year's combined tuna pack for those areas totaled about 12.9 million cases--an increase of 800,000 cases or 6.6 percent as compared with the previous record pack in 1961 for the same period. The pack in the areas mentioned represents about 70 percent of the total pack in the United States, American Samoa, and Puerto Rico, during 1962.

The California tuna pack up to November 1 totaled 9.6 million cases in 1962, or an increase of 500,000 cases as compared to the same period in 1961. Up to October 1, the combined 1962 pack in Puerto Rico, American Samoa, and Hawaii of almost 2.8 million cases was over 400,000 cases more than at the same date in 1961. The increase was both in white meat and light meat tuna.

* * * * *

BLUEFIN TAGGED OFF CALIFORNIA:

A total of 960 tagged bluefin tuna was released from the commercial purse-seiner West Point August 13-23, 1962, by the U. S. Bureau of Commercial Fisheries Biological Laboratory, San Diego, in cooperation with the California Department of Fish and Game.

Releases were made about 30 miles north of the 176-Fathom Spot (30° N., 117° W.), the 43-Fathom Spot (32°36' N., 118°06' W.), and 20 miles west of the north end of San Clemente Island (33°00' N., 119°00' W.). These releases are the first of a series designed to provide vital information on migration, availability, and other aspects of the life history of this little-known tuna in the eastern north Pacific.

Tags used are of standard yellow plastic dart-type design, identical to those used by the Inter-American Tropical Tuna Commission for marking of yellowfin and skipjack, and are attached to the left side of the fish below and aft of the second dorsal fin. The tags are marked "Return to California Department of Fish and Game." If you should catch a tagged bluefin, please preserve the specimen. Upon return to port, contact waterfront representatives of the Tuna Commission, California Department of Fish and

Game, or U. S. Bureau of Commercial Fisheries. Any one of these representatives will measure and check the condition of the fish, as well as take the tag from it. Be sure to record the date and location of capture. There is a \$1.00 reward for the return of each properly documented tag.

* * * * *

SHARK-TUNA RELATIONSHIPS IN EASTERN PACIFIC UNDER STUDY:

A study of sharks and their relationships with the tropical tuna species has been started by scientists of the U. S. Bureau of Commercial Fisheries Biological Laboratory, San Diego. A total of 160 tagged sharks has been released. Of that number, 70 were released from the commercial fishing vessel Royal Pacific off Guatemala, Colombia, and Ecuador; the remainder were released from the commercial purse-seiner West Point off the Revilla Gigedo Islands.

The tags are monel metal straps attached to the dorsal fin of the shark. A colored vinyl disk has been added on the latest tags to make them more conspicuous. Purse-seine fishermen are requested to look over all sharks taken in purse-seine hauls--a \$1.00 reward will be paid to persons recovering the tags and noting the date and place of capture.



United States Fisheries

COMMERCIAL FISHERY LANDINGS, JANUARY-OCTOBER 1962:

Landings: Landings of fish and shellfish in the United States during the first 10 months of 1962 were 63 million pounds or 2 percent more than during the same period a year earlier. The gain resulted from sharply increased production of menhaden and Maine herring.

Menhaden: Total landings for the first 10 months of 1962 amounted to 216,0 million pounds--about 21 million pounds more than during the same period in 1961. During October, there was a marked increase in landings all along the Atlantic and Gulf Coasts as compared with October 1961.

Salmon: On the basis of the reported pack of canned salmon, it was estimated that the Alaska catch for the 1962 season totaled approximately 280 million pounds--15 million pounds more than in 1961.

Tuna: Landings in California (including transshipments of United States-caught fish from South America) totaled about 257 million pounds to November 10, 1962--30 million pounds less than for the same period in 1961.

Shrimp: South-Atlantic and Gulf States landings amounted to 16.4 million pounds in the first 9 months of 1962--an increase of 12 million pounds as compared with the same



Crows nest of a menhaden fishing vessel operating out of Reedville, Va.

period in 1961. A slight upward trend took place in the landings in all but three of the states.

Mackerel: Jack mackerel landings of 65 million pounds to November 3, 1962, fell slightly below the 70.4 million pounds taken during the same period in 1961. Pacific mackerel with 34.7 million pounds exceeded by 3 million pounds the 1961 landings through the same date.

Maine herring: Landings through September 1962 totaled 142 million pounds--up sharply from the 39.2 million pounds taken during the first 9 months of 1961.



In some areas, shell oysters are brought to the shucking plants in bags. Shuckers may be paid by the number of bags shucked rather than by the volume of shucked oysters. This is the reason for compartmented benches in this New Orleans oyster shucking plant.

United States Commercial Fishery Landings for Periods Shown, 1962 and 1961				
Species	Period	1/1962	1961	Total 1961
		(1,000 Lbs.).		
Anchoovies, Calif.	to Nov. 3	1,800	5,762	7,712
Cod:				
Maine	8 mos.	1,700	1,908	2,507
Boston	10 "	19,600	17,300	18,837
Gloucester	10 "	3,100	2,585	3,358
Total cod		24,400	21,783	24,702
Haddock:				
Maine	8 mos.	1,500	1,881	2,940
Boston	10 "	74,700	73,800	84,093
Gloucester	10 "	13,600	12,722	15,025
Total haddock		89,800	88,403	102,058
Halibut 2/:				
Alaska	9 mos.	27,100	24,496	25,077
Wash. & Oreg.	9 "	11,900	14,121	14,947
Total halibut		39,000	38,617	40,024
Herring, Maine	9 mos.	142,000	39,235	54,463
Industrial Fish,				
Me. & Mass. 3/	10 mos.	40,400	40,186	41,851
Mackerel:				
Jack	to Nov. 3	55,100	70,438	97,608
Pacific	to Nov. 3	34,700	31,688	44,110
Menhaden	10 mos.	2,160,000	2,139,207	2,314,677
Ocean perch:				
Maine	8 mos.	50,800	55,606	77,350
Boston	10 "	700	559	701
Gloucester	10 "	50,600	49,876	53,991
Total ocean perch		102,100	106,041	132,042
Salmon:				
Alaska	year	279,700	264,814	264,814
Oregon	5 mos.	1,200	835	7,064
California	year	6,000	8,638	8,638
Sardine, Pacific	to Nov. 15	13,300	31,333	43,169
Scallops, sea, New Bedford (meats)	10 mos.	17,000	17,534	20,648
Shrimp (heads-on):				
So. Atl. & Gulf	9 mos.	116,400	104,436	153,544
Washington	9 "	1,400	751	1,464
Oregon	5 "	1,000	224	1,427
Squid, California	9 mos.	7,100	1,360	5,410
Tuna, California	to Nov. 10	257,300	286,880	307,263
Whiting:				
Maine	8 mos.	17,500	13,761	14,147
Boston	10 "	200	99	144
Gloucester	10 "	4,700	49,189	51,598
Total whiting		22,400	63,049	65,889
Total all above items . . .		3,422,100	3,361,234	3,738,575
Other 4/		665,700	663,530	1,442,196
Grand Total		4,087,800	4,024,764	5,180,771

1/Preliminary.

2/Dressed weight.

3/Includes anchovy.

4/Includes landings for species not listed.

Note: Finfish generally converted to round weight, crustaceans to weight in the shell, and mollusks reported in meats only.

* * * * *

FISH STICKS AND PORTIONS PRODUCTION, JULY-SEPTEMBER 1962:

United States production of fish sticks amounted to 15.8 million pounds and that of fish portions was 18.5 million pounds during the third quarter of 1962, according to preliminary data. This was a gain of nearly 1 percent in fish sticks and 26 percent in portions as compared with the same

Table 1 - U.S. Production of Fish Sticks by Months and Type,
July-September 1962 1/

Month	Cooked	Raw	Total
	(1,000 Lbs.)		
July	3,262	351	3,613
August	5,315	381	5,696
September	6,005	501	6,506
Total 3rd Qtr. 1962 1/	14,582	1,233	15,815
Total 3rd Qtr. 1961 .	14,450	1,258	15,708
Tot. 1st 9 mos. 1962 1/	49,049	3,725	52,774
Tot. 1st 9 mos. 1961 .	48,172	3,608	51,780
Tot. Jan.-Dec. 1961 .	65,006	4,813	69,819

1/Preliminary.

Table 2 - U. S. Production of Fish Sticks by Areas,
July-September 1962 and 1961

Area	1/1962		2/1961	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	20	12,789	22	12,625
Inland & Gulf States .	4	1,765	6	1,647
Pacific Coast States .	8	1,261	10	1,436
Total	32	15,815	38	15,708

1/Preliminary.

2/Revised.

Table 3 - U.S. Production of Fish Sticks by Months, 1958-1962

Month	1/1962	2/1961	1960	1959	1958
	(1,000 Lbs.)				
January	6,104	6,091	5,511	6,277	5,471
February	6,859	7,092	6,542	6,352	5,925
March	7,706	7,233	7,844	5,604	5,526
April	5,480	5,599	4,871	4,717	4,855
May	5,609	5,129	3,707	4,407	4,229
June	5,058	4,928	4,369	4,583	4,702
July	3,613	3,575	3,691	3,790	4,574
August	5,696	6,927	5,013	3,879	4,358
September	6,506	5,206	5,424	5,353	5,328
October	-	6,133	6,560	5,842	5,485
November	-	6,288	6,281	4,831	5,091
December	-	5,618	5,329	4,743	5,467
Total	-	69,818	65,142	60,378	61,011

1/Preliminary.

2/Revised.

quarter of 1961. The increase in portions was due mainly to greater production of raw breaded portions (up 3.8 million pounds).

Cooked fish sticks (14.6 million pounds) made up 92 percent of the fish stick total. The remaining 8 percent consisted of raw fish sticks. A total of 18 million pounds of breaded fish portions (of which 15 million pounds were raw) and 537,000 pounds of unbreaded portions were processed during the third quarter of 1962.

Plants on the Atlantic Coast produced the bulk of the fish sticks and portions--22.4 million pounds. The Gulf and inland States produced 10 million pounds, and the Pacific Coast States, 1.9 million pounds.

During the first 9 months of 1962, fish stick production of 52.8 million pounds was up 2 percent, and the fish por-

tions production of 55.3 million pounds was up 31 percent as compared with the first 9 months of 1961.

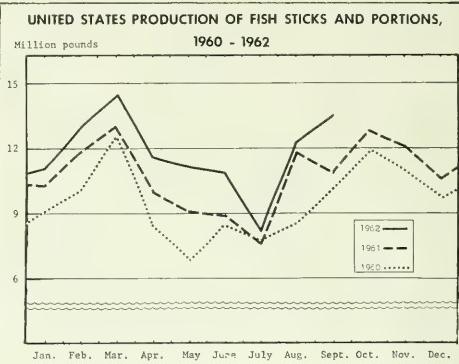


Table 4 - U. S. Production of Fish Portions by Months and Type, July-September 1962 1/

Month	Breaded			Total	
	Cooked	Raw	Total		
July	486	3,998	4,484	222	4,706
August	957	5,565	6,522	140	6,662
September	1,561	5,423	6,984	175	7,159
Tot. 3rd Qtr. 1962 1/	3,004	14,986	17,990	537	18,527
Tot. 3rd Qtr. 1961	2,597	11,633	14,230	440	14,670
Tot. 1st 9 mos. 1962 1/	9,743	43,995	53,738	1,580	55,318
Tot. 1st 9 mos. 1961	7,485	33,219	40,704	1,404	42,108
Tot. Jan.-Dec. 1961	11,003	46,783	57,786	2,061	59,847

1/Preliminary.

Table 5 - U. S. Production of Fish Portions by Months, 1958-1962

Month	1/1962	2/1961	1960	1959	1958
	(1,000 Lbs.)				
January	5,102	4,303	3,632	2,692	1,973
February	6,374	4,902	3,502	3,025	1,254
March	6,931	5,831	4,706	3,225	1,471
April	6,350	4,484	3,492	2,634	2,268
May	5,749	3,879	3,253	2,584	1,478
June	6,082	4,039	3,995	3,247	1,504
July	4,706	3,962	4,088	2,227	2,161
August	6,662	4,963	3,558	2,796	1,518
September	7,159	5,745	4,631	3,558	1,566
October	-	6,759	5,275	4,314	2,560
November	-	5,789	4,790	3,483	1,979
December	-	5,191	4,459	3,262	2,060
Total	-	59,847	49,381	37,147	21,790

1/Preliminary.

2/Revised.

Table 6 - Production of Fish Portions by Areas,
July-September 1962 and 1961

Area	1/1962		2/1961	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	23	9,601	23	8,744
Inland & Gulf States	7	8,258	12	5,578
Pacific Coast States	8	668	6	348
Total	38	18,527	41	14,670

^{1/Preliminary.}

U. S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED, SEPTEMBER 1962:

During September 1962, a total of 26 vessels of 5 net tons and over were issued first documents as fishing craft, as compared with 22 in September 1961. There were 36 documents cancelled for fishing vessels in September 1962 as compared with 25 in September 1961.



Table 1-U.S. Fishing Vessels^{1/} --Documentation Issued and Cancelled, by Areas, September 1962 with Comparisons

Area (Home Port)	September		Jan.-Sept.		Total
	1962	1961	1962	1961	
Issued first documents ^{2/}:					.....(Number).....
New England	2	1	24	27	33
Middle Atlantic	-	2	2	11	12
Chesapeake	3	5	29	48	75
South Atlantic	6	6	37	40	47
Gulf	9	4	87	87	100
Pacific	5	4	115	141	149
Great Lakes	1	-	3	11	12
Puerto Rico	-	-	-	2	2
Total	26	22	297	367	430
Removed from documentation ^{3/} :					
New England	5	2	19	15	20
Middle Atlantic	3	4	31	23	34
Chesapeake	2	1	19	27	28
South Atlantic	4	2	29	21	30
Gulf	15	7	86	77	103
Pacific	4	8	82	71	112
Great Lakes	3	1	18	13	14
Hawaii	-	-	3	-	-
Puerto Rico	-	-	1	-	-
Total	36	25	288	247	341

^{1/}For explanation of footnotes, see table 2.

Table 2-U.S. Fishing Vessels--Documents Issued and Cancelled, by Tonnage Groups, September 1962

Gross Tonnage	Issued ^{2/}	Cancelled ^{3/}
5-9	3	9
10-19	6	5
20-29	6	5
30-39	1	5
40-49	2	2
50-59	-	4
60-69	2	1
70-79	3	2
80-89	1	1
120-129	-	1
260-269	1	-
270-279	-	1
340-349	1	-
Total	26	36

^{1/}Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.^{2/}Includes redocumented vessels previously removed from records. Vessels issued first documents as fishing craft were built in 1962, and 8 prior to 1950. Assigned numbers to boats of 5 ft. or more.^{3/}Includes vessels reported lost, abandoned, forfeited, solid alien, etc.

Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.



U.S. Foreign Trade

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-September 29, 1962, amounted to 42,335,267 pounds (about 2,015,965 std. cases), according to data compiled by the Bureau of Customs. This was 4.1 percent more than the 40,664,702 pounds (about 1,936,414 std. cases) imported during January 1-September 30, 1961.

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1962 at the 12½-percent rate of duty is limited to 59,059,014 pounds (about 2,812,000 std. cases of 48 7-oz. cans). Any imports in excess of the quota are dutiable at 25 percent ad valorem.

* * * * *

EDIBLE FISHERY PRODUCTS, SEPTEMBER 1962:

Imports of fresh, frozen and processed edible fish and shellfish into the United States in September 1962 were up 9.8 percent in quantity and 6.8 percent in value as compared with the previous month. In September, there was a large increase in imports of frozen albacore tuna (mostly from Japan and British West Pacific Islands). Imports were also

up for fish blocks and slabs, groundfish fillets, fillets other than groundfish, canned tuna in brine, canned sardines in oil (increase mostly from Norway and Portugal), canned sardines not in oil (increase from South Africa), and frozen shrimp. There was a decline in imports of some of the higher priced products such as fresh and frozen salmon (mostly from Canada), canned salmon (mostly from Canada and Japan), fresh swordfish (from Canada), canned crab meat (mostly from Japan), canned oysters (mostly from Japan), live lobsters (from Canada), frozen spiny lobsters, sea scallops (mostly from Canada), and frozen frog legs (mostly from India and Japan).

Compared with the same month in 1961, the imports in September 1962 were up 35.9 percent in quantity and 31.9 percent in value. Imports were much greater this September for frozen tuna (increase mostly from Japan and Peru). Imports also increased for fish blocks and slabs, groundfish fillets, fillets other than groundfish, fresh and frozen salmon in oil, canned sardines not in oil, canned oysters, frozen shrimp, and frog legs. But imports of canned salmon dropped sharply and there was some decline in imports of canned tuna in brine, live lobsters (from Canada), and sea scallops.

In the first nine months of 1962, imports were up 18.1 percent in quantity and 23.9 percent in value as compared to the same period in 1961. The greater increase in value was because of the higher prices which prevailed this year for most imported fishery products. Most fishery products were imported in greater quantity this year and imports were up substantially for fish blocks or slabs (increase mostly from Norway), canned salmon (mostly from Canada and Japan), frozen tuna (increase mostly from Japan and Peru), canned tuna in brine other than albacore (mostly from Japan), canned sardines in oil, frozen shrimp, and sea scallops. Imports were down for the following products: haddock fillets, fresh and frozen salmon (mostly from Canada), canned albacore tuna in brine, canned bonito and yellowtail, canned oysters (mostly from Japan), and fresh swordfish (from Canada).

U. S. Imports and Exports of Edible Fishery Products, September 1962 with Comparisons									
Item	QUANTITY			VALUE			Sept.	Jan.-Sept.	Sept. [Jan.-Sept.]
	Sept.	Jan.	Sept.	Sept.	Jan.	Sept.			
Imports:	1962	[1961]	1962	[1961]	1962	[1961]	1962	[1961]	1962 [1961]
Fish & Shellfish:									
Fresh, frozen, & processed ^{1/} . . .	112.8	83.0	879.4	744.6	34.7	26.3	293.5	236.8	
Exports:									
Fish & Shellfish:									
Processed only ^{1/} (excluding fresh & frozen) . . .	2.5	1.3	23.7	17.4	1.1	0.7	9.9	9.0	
1/Includes pastes, sauces, clam chowder and juice, and other specialties.									

Exports of processed fish and shellfish from the United States in September 1962 were up 47.1 percent in quantity and 22.2 percent in value as compared with the previous month. Exports were up in September 1962 for canned salmon (mostly to the United Kingdom), canned sardines in oil, canned sardines not in oil, and canned squid. But exports were down for canned mackerel and canned shrimp (mostly to Canada and the United Kingdom).

Compared with the same month in 1961, the exports in September 1962 were up 92.3 percent in quantity and 57.1 percent in value. Exports were up this September for canned salmon, canned sardines in oil, canned sardines not in oil, canned shrimp, and canned squid. The increase was slightly offset by a decrease in exports of canned mackerel. Most of the increase in exports this Septem-

ber was concentrated in the lower priced products so the value of the exports did not increase as much as the quantity.

Processed fish and shellfish exports for the first nine months of 1962 were up 36.2 percent in quantity, but the value was up only 10.0 percent as compared with the same period of 1961. Exports of the lower priced canned squid (principally to Greece and the Philippines) showed the greatest increase in 1962. Exports were also up for canned mackerel, canned salmon, and canned sardines not in oil. But exports were down for canned shrimp (decline mostly in exports to Canada and the United Kingdom). Although not covered in the table, exports were up for frozen salmon, and were down for frozen shrimp (decline mostly in exports to Japan) and shucked oysters (principally to Canada).



Wholesale Prices

EDIBLE FISH AND SHELLFISH, OCTOBER 1962:

Prices of fishery products during October 1962 were generally slightly lower. The October 1962 wholesale price index for edible fishery products (fresh, frozen, and canned) at 119.0 percent of the 1957-59 average was lower (down 0.7 percent) than for September because of lower prices for fresh and frozen shrimp, a more marked price drop for frozen salmon, and a sharp price decrease for Great Lakes yellow pike. As compared with October a year earlier, most of the fishery products index items were higher priced in October 1962.

The fresh and frozen drawn, dressed, or whole finfish subgroup index this October dropped 3.4 percent from the previous month due to lower prices at New York City for frozen dressed king salmon (down 6.9 percent) and Great Lakes yellow pike (down 15.2 percent). From September to October 1962, prices rose for fresh large haddock (ex-vessel price at Boston up 1 cent a pound, or 5.2 percent), frozen dressed western halibut (wholesale price at New York City up 2.4 percent), and fresh Lake Superior whitefish (wholesale price at



Shrimp, prior to canning, being carefully inspected at a cannery plant in Westwego, La.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, October 1962 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes 2/ (1957-59=100)			
			Oct. 1962	Sept. 1962	Oct. 1962	Sept. 1962	Aug. 1962	Oct. 3/1961
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					119.0	119.8	121.0	111.2
Fresh & Frozen Fishery Products:					124.3	125.6	124.3	109.1
Drawn, Dressed, or Whole Fish(es):					150.7	150.0	131.0	107.1
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.11	.10	82.2	78.1	103.8	82.6
Halibut, West., 20/30 lbs., drsd., fresh or froz.	New York	lb.	.44	.43	129.6	126.5	138.9	102.0
Salmon, king, lge., & med., drsd., fresh or froz.	New York	lb.	.58	1.05	136.2	146.3	146.7	118.8
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.73	.66	108.2	98.5	78.4	103.0
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.48	.56	77.8	91.7	81.9	73.7
Processed, Fresh (Fish & Shellfish):					123.8	123.1	117.6	113.5
Fillets, haddock, smd., skins on, 20-lb. tins	Boston	lb.	.38	.36	92.3	86.2	88.8	77.7
Shrimp, lge. (20-30 count), headless, fresh	New York	lb.	1.05	1.07	122.5	125.4	114.3	101.4
Oysters, shucked, standards	Norfolk	gal.	7.75	7.50	130.7	126.5	126.5	134.9
Processed, Frozen (Fish & Shellfish):					122.7	122.8	117.8	102.5
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.40	100.1	100.1	100.1	97.6
Haddock, smd., skins on, 1-lb. pkg.	Boston	lb.	.36	.35	105.5	101.1	101.1	96.7
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.32	.32	110.4	110.4	105.2	105.1
Shrimp, lge. (20-30 count), brown, 5-lb. pkg.	Chicago	lb.	1.13	1.15	134.0	136.4	128.1	104.4
Canned Fishery Products:					110.2	110.2	117.4	115.5
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	25.50	25.50	111.1	111.1	124.2	122.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.75	11.75	104.4	104.4	107.9	103.5
Sardines, Calif., torn, pack, No. 1 oval (16 oz.), 24 cans/cs.	Los Angeles	cs.	5.25	5.25	118.5	118.5	118.5	110.6
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	9.11	9.11	110.9	110.9	119.4	132.2

1/ Represents average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/Beginning with January 1962 indexes, the reference base of 1947-49=100 was superseded by the new reference base of 1957-59=100.

3/Recomputed to be comparable to 1957-59=100 base indexes.

Chicago up 7 cents a pound, or 9.8 percent). Compared with the same month of 1961, the subgroup index this October rose 12.7 percent. Prices were up sharply for frozen dressed western halibut (up 26.3 percent) and frozen dressed King salmon (up 14.6 percent); prices were also higher for Lake Superior whitefish (up 5 percent) and yellow pike (up 5.6 percent).

The fresh processed fish and shellfish subgroup index rose slightly (up 0.6 percent) from September to October this year, and was up 9.1 percent from October 1961. Fresh shrimp prices at New York City were firm in September, but brief fluctuations toward the end of that month indicated the beginning of a downward trend from the spiraling midsummer prices. Although fresh shrimp prices this October were down 2.3 percent from the previous month, they were still 20.8 percent higher than in the same month of 1961. Prices this October for fresh small haddock fillets at Boston were higher (up 7.1 percent) than in September and in October 1961 (up 18.8 percent). Fresh shucked oysters (standards) at Norfolk in October rose 25 cents a gallon from September, but were lower than the \$8.00 high of October 1961.

Slightly lower frozen shrimp caused a fractional decrease (down 0.1 percent) in the processed frozen fish and shellfish subgroup index this October, but the index was still 19.7 percent higher than in October 1961. From September to October, prices were lower for frozen shrimp (wholesale prices at Chicago down 2 cents a pound, or 1.8 percent), but prices were higher for haddock fillets (up 4.5 percent) at Boston. The shrimp supply situation improved somewhat in Oc-

tober with an increase of about 6 million pounds in stocks of raw headless shrimp from the end of September to the end of October. Domestic shrimp landings were better in October, but much of the increase was in imports from Mexico. As compared with October 1961, prices this October were higher for all items in the subgroup; prices for frozen shrimp were up 28.4 percent and haddock fillets were up 9.1 percent.

The canned fishery products subgroup index in October was unchanged from September, but was down 4.6 percent from October 1961 due to lower prices of canned Pacific salmon and canned Maine sardines. Prices of all items in the canned fish subgroup this October were the same as the previous month. The 1962 packs of canned tuna, canned Maine sardines, and canned pink salmon all exceeded those of the previous season. As of the end of October, the California canned tuna pack amounted to 9.6 million cases; the canned Maine sardine pack was 2.1 million cases, the first season since 1958 that the pack exceeded 2 million cases; the Alaska pink salmon pack was about 1.8 million cases, the largest pack for the past 8 years.

As compared with a year earlier, canned tuna prices this October were still about 1 percent higher but canned Maine sardine prices were 11.6 percent lower than at the same time last year. The October 1962 California sardine landings were very light. Stocks of California canned sardines were limited in October with prices holding at \$5.25 a case the same as in September, but 7.1 percent higher than a year earlier.





FOREIGN

International

GENERAL AGREEMENT ON TARIFFS AND TRADE

TWENTIETH SESSION OF CONTRACTING PARTIES:

The 20th Session of the Contracting Parties to the General Agreement on Tariffs and Trade met in Geneva, Switzerland, from October 23 to November 16, 1962. The Assistant Secretary of State for Economic Affairs headed the United States Delegation.

The Contracting Parties considered an agenda of more than 60 items. A major topic was an assessment of progress made in the GATT Program for the Expansion of International Trade since it was dealt with at the 1961 GATT Ministerial Meeting. Key elements of this program are tariff reduction, improved access to markets for agricultural products, and removal of obstacles to the trade of the less developed countries.

The United States Delegation gave special attention to quantitative restrictions originally justified for balance of payments reasons, but which are now in violation of the GATT. Increasing United States concern over quantitative restrictions has led to a formal complaint against French and Italian quota restrictions which was listed on the agenda at this Session for action. Also pending is the Canadian Government's recent imposition of customs duty surcharges. The U. S. Delegation hoped to seek the earliest possible elimination of these surcharges.

The progress of regional economic groupings were reviewed, including the Latin American Free Trade Area, the Central American Free Trade Area, and particularly the Common Agricultural Policy of the European Economic Community.

At least two newly-independent nations, Trinidad and Tobago and Uganda, were to be admitted formally as contracting parties at the Session. The GATT membership has

been growing steadily now numbering 42 nations covering more than 80 percent of free world trade. The Contracting Parties were expected to consider the future relationship to the GATT of Argentina, Poland, Spain, and Yugoslavia, which now participate in the work of the GATT under various special arrangements.

The GATT is the basic international instrument guiding commercial relations among most of the principal trading nations of the world. The provisions of the GATT are designed to expand international trade and thereby to raise living standards, increase productive employment, and utilize more fully the resources of the world. The meetings of the Contracting Parties provide an international forum to discuss trade policy problems and to resolve trade difficulties in a manner conducive to the growth rather than the reduction of trade levels.

EUROPE

WEST EUROPEAN FISHERY CONFERENCE HELD IN GOTEBORG:

On September 6, 1962, a total of 42 delegates attended the West European Fishery Conference held in Goteborg, Sweden, Belgium, Denmark, France, West Germany, Netherlands, Portugal, Spain, Great Britain, Norway, and Sweden were represented. The Conference discussed marketing problems arising from the present EEC negotiations and their effect on the fishing industry of the various countries.

The President of EUROPECHE, in his address to the conference, stressed the need for continued cooperation between fishery organizations of the member countries regardless of the outcome of the present trade-political developments in Europe. He stated that they should carefully study and observe these developments as the fishery organizations may have an opportunity to influence future market developments. The Scandinavian representatives indicated that they were of the opinion that the fishermen and fisheries organizations themselves could reach satisfactory agreements on their marketing problems, but inasmuch as the European fishing industry is only a small detail in the over-all EEC picture, that undoubtedly the final decisions affecting the industry would be made on a high political level.

In spite of the fact that the Conference did not result in any positive productive agreements, the question of territorial fishing limits was explored. During this discussion, it became apparent that if Sweden should fail to become associated with the Common Market, it would suffer with regard to its natural fishing area along the Norwegian coast. The EEC members have resisted any extension of territorial limits that would restrict the fishing rights of the member countries. It is the

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intent of the EEC that a three-mile limit with regard to fishing rights be applicable in all EEC countries for all EEC members. At the present time, Norway and Sweden have an agreement that Swedish fishermen must fish outside a twelve-mile limit along the Norwegian west coast. If this situation continues and Sweden does not associate with the Common Market, it will be placed in the unenviable position of fishing outside the twelve-mile limit while her competitors will have the privilege of fishing outside the three-mile limit along the Norwegian coast. This disadvantage could seriously impair the Swedish fishing industry, which is one of the most important industries on the west coast of Sweden.

Another topic that was discussed by the delegates concerned the North Sea-Atlantic Fishery Convention of 1959. It is hoped that this Convention can be placed in effect in 1963, but this will depend upon ratification by Ireland and West Germany, the only countries concerned that have failed to sign this Convention at the present time. When this Convention takes effect, a large international research program of the fishing industry is planned and will undoubtedly concern itself with the various problems that exist at the present time for the North Sea-Atlantic fishermen.

One positive action resulting from this Conference in Goteborg was a resolution that the delegates should alert their governments to the fact that the supply of herring in the North Sea has decreased this year. It was suggested that this might be the result of overfishing in that area. Another positive action taken at the Conference was the approval of an Italian application for membership, but there was no Italian representation at the meeting.

The West European Fishery Conference, originally founded by trawler organizations in Holland and England, serves as an information organization for the member countries. The Conference was hampered and prevented from accomplishing positive results by the unsettled situation surrounding the present EEC negotiations. Because of the present EEC negotiations being carried on by certain member countries, the delegates were reluctant to express their views or to commit themselves to any definite position, pending the outcome of the EEC negotiations.

The Conference next year will be held in Denmark, and if the present situation regarding EEC developments is settled, this Conference may prove to be of much greater value to the fishing industries in Western Europe. (United States Consulate, Goteborg, September 27, 1962.)

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SCANDINAVIAN AND BRITISH FISHERIES ASSOCIATIONS MEET:

Representatives from fisheries associations of the United Kingdom, Norway, Sweden, and Denmark met in London in mid-September 1962 to discuss mutual problems, presumably connected primarily with Common Market developments, according to Danish newspaper reports. The Danish representatives, one from each of the two largest fishermen's associations, stated that the discussions were confidential commenting only that they were for orientation purposes and gave promise of future fruitful cooperation. (European Regional Fisheries Attaché, United States Embassy, Copenhagen, September 26, 1962.)

FOOD AND AGRICULTURE ORGANIZATION

ASIATIC FRESH-WATER SHRIMP CULTURE EXPERIMENTS SUCCESSFUL:

The giant fresh-water shrimp found throughout Asia has always been regarded as a choice food. In addition, nutritionists consider shrimp a high source of protein, and as such, would like to see more of it made available. Fresh-water shrimp supplies from the usual natural sources have always been scarce, and no one has yet been able to breed and grow them successfully in captivity.

Fishery scientists have for years been interested in shrimp farming, and some experiments already have been conducted in several Asiatic countries, Australia, the United States, and other countries. A fisheries biologist (Dr. Shao-Wen Ling) of the Food and Agriculture Organization, who has been experimenting in a laboratory at Penang, Malaya, is reported to have been successful in breeding and growing fresh-water shrimp.

The biggest problem in shrimp culture has always been that little is known about the biology and habits of the giant fresh-water shrimp, especially in its early stages. Baby



Larger of the two is an adult giant fresh-water shrimp (*Macrobrachium rosenbergii*) raised in a Malayan laboratory by a FAO biologist.

shrimp, or more properly larvae, are plentiful enough in their native habitat, but their growth has always been more or less guess work. By the time this variety of shrimp become fully grown, their numbers have always been drastically reduced. The FAO biologist, working on assignment with the Malayan Government, took two and a half years to learn about the growth of fresh-water shrimp.

For his experiments, the FAO biologist selected the giant Malayan fresh-water shrimp (*Macrobrachium rosenbergii*), which is also indigenous in the tropical waters of all countries of the Indo-Pacific region. His first problem was to find out something about the shrimp's actual reproductive habits. Observations showed that mating would occur only if the female was in the very short and specific mating condition. Only then would mating take place. After mating, the male would protect the female from all comers, instead of attacking her. Next, it was necessary to study the best conditions under which eggs, after a long incubation period, would hatch into healthy larvae.

Despite the apparent success to that point, it was only the beginning. The main task was to develop ways and means of growing the larval shrimp to maturity. At first, the thousands of larvae produced in the laboratory were reared in fresh-water but they all died within 4 to 5 days

International (Contd.):

after hatching. Similar failures occurred repeatedly for more than six months. The thought occurred that perhaps in their natural habitat the new-born shrimp moved to different waters. Perhaps they moved downstream to where the river was influenced by the tides and became more brackish water. The scientist then decided to add a small amount of sea water to the fresh water, and soon young larvae were kept living for as long as a week. But since it takes almost a year for a baby shrimp to become an adult, he started again with water of higher salinity and found that the shrimp lived a little longer. The experiments continued in that manner until he found that by gradually increasing the salinity of the water, he could make them live longer. But each failure meant starting all over again, and it took two years to grow the baby shrimp up from larvae to the juvenile stage, and from the juvenile to adult stage.

Meanwhile, each larva had gone through 15 different moulting periods before it grew into a juvenile, and the water had been increased in salinity until it contained 40 percent sea water. After that, it was discovered that the juveniles put back into fresh water survived quite successfully.

As a result of these experiments, the scientist was led to believe that the larvae hatch upriver in fresh water, and then gradually move downriver toward the sea until they become juveniles in brackish water near the coast. The juvenile shrimp then move back up the river to grow to full size and breed again. At that stage they can survive in rivers, canals, ponds, or even rice fields. In fact, the fully grown giant fresh-water shrimp are usually caught in those places.

But water salinity was not the only problem. The scientist had to find the right kinds of food, and a proper way of feeding the shrimp. He tried many foods and feeding techniques, and even imported the eggs of the Artemia or brine shrimp. These were hatched out and fed to the young shrimp larvae. This appeared to work out very well but was not economically practical because of the high cost. Local ocean zooplankton was tried as a food but this also proved impractical. Better results were obtained from using fish eggs, which the shrimp seemed to like, but even these were too expensive.

A simple and uncomplicated solution to the food problem was finally found. Any day in the Penang Market, as in most markets in that region, fish balls (made up of finely ground fish) can be bought. The scientist discovered that when these were broken up, they made an excellent and very cheap food for the young larval shrimp. The standard practice of feeding, he believes, will be to feed fish eggs to the very young larvae, and then, as they get larger, change their diet to crushed fish balls, with Artemia as a supplementary food.

The over-all problem, even at that stage, was not completely solved. While the experiments were successful under laboratory conditions, the objective was to breed shrimp on a large scale, and to achieve a process that was simple and standardized. That was the final stage of the scientist's experimental studies. He found that the problem of increasing salinity was comparatively simple. If the hatchlings or larvae were reared in large open containers, the normal evaporation process would increase the salt content, and it would require very little control by the operator who would only need to add a little fresh or salt water to keep it constant.

The scientist gradually reduced the feeding process to a set routine. Now he believes that with a little more improvement, it will be possible to evolve a simple and practical method for almost anyone, with some training, to culture giant fresh-water shrimp.

The FAO scientist believes that, in the near future, the Asian farmwife or fishermen's wife should be able to raise

and keep shrimp just as easily and profitably as the European farmwife keeps hens. (News release, September 20, 1962, Food and Agriculture Organization, Rome.)

* * * * *

FAO REQUESTS FUNDS FOR CENTRAL AMERICA FISHING INDUSTRY STUDY:

The Food and Agriculture Organization (FAO) has requested a \$2 million grant from the United Nations special fund for a three-phase regional study of the fishing industry in Central America: (1) exploration of the fish resources of Central American waters (Pacific and Caribbean); (2) possibilities of commercialization of an expanded fishing catch; (3) possibilities of industrialization, particularly canning and byproducts.

The FAO plan calls for 10 to 15 experts, some of whom would be expected to arrive in Central America in June 1963, if the project is approved and the necessary funds appropriated. (October 16, 1962, report from Guatemala.)

INTERNATIONAL ASSOCIATION OF FISH MEAL MANUFACTURERS

REPORT ON THIRD ANNUAL CONFERENCE:

Over 100 delegates and observers from 18 countries representing the principal fish meal producers in the world attended the Third Annual Conference of the International Association of Fish Meal Manufacturers (IAFMM) in London, October 9-12, 1962. Twenty-five prominent scientists from France, Germany, Iceland, Norway, Peru, Portugal, South Africa, Spain, the United States, United Kingdom, and the Argentine, as well as from the Food and Agriculture Organization (FAO) held detailed discussions on a wide range of topics of importance to the industry, among them: achieving uniform methods of analysis, nutritional matters, the use of fish oil in animal feeding, and scientific methods of promotion of increased usage of fish meal.

Manufacturers and scientists considered together matters which had been discussed at the Scientific Meetings, with particular reference to their commercial application. Other matters discussed were increase of world markets; promotion methods, particularly in underdeveloped markets or countries; expanded advisory services generally; and various nutritional matters. The Conference

International (Contd.):

received full reports from the U. S. Bureau of Commercial Fisheries on work on fish protein concentrate (fish flour) about to be undertaken in the United States; and from FAO on a large-scale pilot scheme for feeding fish protein concentrate, about to start in Peru.

Problems relating to analytical methods and quality standards in the European Common Market were discussed. FAO is preparing a new and revised edition of its publication "Animal Feedstuffs--Regulations Governing their Manufacture and Sale in European Countries." During the coming year IAFMM will consider participation in the Freedom from Hunger Campaign and the World Food Congress in 1963. It endorsed and welcomed the objects of the Campaign and the Congress.

A total of 13 national associations and 12 individual companies (in Denmark, Sweden, and the United States) belong to the IAFMM. Observers present were from the Argentine, Chile, Japan, the Fishmeal Exporters Organization (FEO), FAO, the U. S. Bureau of Commercial Fisheries, and the United States Embassy, Copenhagen. More than half of the United States companies belonging to IAFMM were represented.

A summary of the more important matters discussed in the General and Scientific Committee sessions follows.

Meeting with Brokers, Agents and Importers: An FEO member initiated the discussion by giving world figures for production of fish meal as 2,550,000 metric tons in 1961 and 2,700,000 tons in 1962 with production and demand about in balance. FEO quotas for 1963 were stated to be the same as the physical exports in 1962.

On promotional problems it was deemed helpful to summarize and circulate what had been done in various countries, and brokers, agents, and importers were asked to submit suggestions for promotion in their countries to IAFMM and FEO for consideration.

Promotion of Increased Usage of Fish Meal: FEO had decided to finance the employment of one or two experts, but was having difficulty finding the right man.

There was no urgent need for an advanced brochure on fish meal usage, but a Norwegian scientist and a British scientist were preparing a "Summary of Past Research on the Use of Fish Meal in Poultry Nutrition," to be ready by March 1, 1963.

Feeding Trials: There is a more urgent need for further analytical work on fish meal than for further feeding trials with computed rations. It is also important to be able to distinguish a good meal from a poor one and to control the quality of the meal used in trials. Some compounders deliberately discount part of the nutrient content of fish meal on the basis of incomplete availability, but make no such deduction for soybean meal. An example is the methionine content of menhaden meal.

Analytical Methods: Discussion centered on fat determination and pepsin digestibility. For the former a strong case was made for limiting it to fat extractable with hexane or ether, and discarding methods for total fat including the badly oxidized fat. The practical significance of the latter is uncertain, and some further studies on it are in progress.

Pepsin digestibility is plagued by extreme differences in technique in different countries and the results do not correlate satisfactorily with protein quality. It would be better to abandon this test in favor of the available lysine test. However, no single amino acid is an infallible index for all others and a routine method for available methionine would be particularly helpful.

Antioxidants: There was considerable discussion as to whether oxidation of the oil in meal should be promoted, rather than hindered by addition of an antioxidant. In South Africa deliberate oxidation by heat curing is advocated to prevent later spontaneous heating. This is claimed not to reduce the nutritional value of the protein but others were concerned about oxidation products which can react with lysine and lower its availability. It was reported that contrary to earlier belief the phospholipids in fish meal do not oxidize as readily as the true fat. Solubles added to meal reduce the extent of damage if the meal is overheated. This may be because certain constituents of the solubles reinforce the action of natural antioxidants in the meal. Retention of meal for a somewhat longer time in the drier re-

International (Contd.):

duces the extent of any later spontaneous heating.

Fish Oils: Much work is going on in the United States on the use of menhaden oil in poultry nutrition. Much of it is confidential, being done by individual companies. High quality of the oil used is absolutely vital, but with good oil part or all of the fat added to the ration can be replaced by fish oil. On a calorie basis fish oil is superior to tallow and similar fatty materials now used and with broilers there is a growth response as a bonus. This feedingstuff outlet is far more important potentially than the outlet for hydrogenated fats in human use. In another direction, products prepared from fish oil can be used to alter the rumen metabolism in dairy cows to give a higher milk yield at the same food consumption. The characteristic of such foods as eggs and milk can be favorably altered by judicious use of fish oils and products made from fish oils. The unique chemical character of fish oils should be regarded as an asset rather than a disadvantage.

Fish Protein Concentrate: The Conference was fully informed of the latest developments in the United States, including distribution of a newly-issued series of leaflets issued by the U. S. Bureau of Commercial Fisheries.

The FAO observer also reported to the meeting on a large-scale pilot scheme for feeding fish protein concentrate which had been requested by the Peruvian Government and which should commence soon. Some of the initial supplies would be made available from South Africa and Chile. The Peruvian fish meal manufacturers were assisting financially and were also developing a suitable product.

Next Conference and Meetings: The IAFMM was invited to hold its Fourth Annual Conference in Lima, Peru, by the Peruvian member. The invitation will be considered at the next Executive Council Meeting. At previous Conferences there has been some doubt about meeting in either Peru or South Africa because of the travel involved for most members. Executive Council and Scientific Committee meeting dates were left to be established by the executive

officers and Director. (Regional Fisheries Attaché for Europe, United States Embassy, October 24, 1962.)

Note: See Commercial Fisheries Review, September 1962 p. 56, April 1962 p. 37.

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION**RESULTS AND RECOMMENDATIONS
OF SECOND SESSION:**

The International Cooperative Investigation of the Tropical Atlantic (ICITA) was approved by the Intergovernmental Oceanographic Commission (IOC) at its second session held in Paris, September 20-28, 1962. Also approved was the participation in IOC meetings of any research organization, such as the International North Pacific Fisheries Commission.

One of the resolutions passed at the meeting was the recommendation that fisheries work be considered a part of the International Indian Ocean Expedition.

Note: See Commercial Fisheries Review, November 1962 p. 58.

INDO-PACIFIC FISHERIES COUNCIL**TENTH SESSION HELD IN SEOUL:**

The Tenth Session of the Indo-Pacific Fisheries Council was held in Seoul, Korea, October 10-25, 1962. Representatives from 14 of the 17 member countries attended, including a United States delegate from the Bureau of Commercial Fisheries.

The Tenth Session was devoted to discussions on improvements in the fishery industries, and included both marketing and biological aspects.

The Koreans were especially interested in this conference from a technical point of view as their fishing industry holds a good potential for increasing the country's exports. Broadening the scope of their fishery activities, and participation in international conferences on the fisheries has been of particular interest to the Koreans.

The functions of the Indo-Pacific Fisheries Council are: (1) to assemble and disseminate technical information on aquatic resources, (2) to encourage and coordinate research along those lines, and (3) to recommend development programs, as they become necessary, to member governments. (Bi-weekly Economic Review No. 21, October 6-19, 1962.)

International (Contd.):

FISH MEAL

WORLD PRODUCTION,
AUGUST 1962:

According to preliminary data from the International Association of Fish Meal Manufacturers, world production of fish meal in August 1962 amounted to about 178,151 metric tons, an increase of 10.4 percent over world production in August 1961.

Most of the principal countries producing fish meal submit data to the Association monthly (see table).

Country	August		Jan.-Aug. 1962
	1962	1961	
	....(Metric Tons)....		
Canada	3,420	4,378	52,613
Denmark	10,365	9,066	60,935
France	1,100	1,100	8,800
German Federal Republic	6,922	6,727	50,239
Netherlands	1/ 700	1/2,400	
Spain	1,954	1,849	17,783
Sweden	253	329	2,759
United Kingdom	6,544	6,503	51,479
United States	35,336	52,191	186,771
Anzola	1/ 5	5,125	1/15,657
Iceland	29,155	11,532	80,579
Norway	18,726	10,626	85,904
Peru	52,716	38,319	662,874
South Africa (including South-West Africa)	11,660	12,900	191,976
Total	178,151	161,345	1,470,769

¹/Data not available for August; data revised for January-July.
Note: Belgium, Chile, Japan, and Morocco do not report their fish meal production to the International Association of Fish Meal Manufacturers at present.

The increase in world fish meal production this August was due mainly to more output in Peru (up 37.6 percent), Iceland (up 152.8 percent), Norway (up 76.2 percent), and Denmark (up 14.3 percent). This year through August, Peru had increased landings of anchoveta, Iceland and Norway had record landings of summer herring, and Denmark's landings of industrial fish were up. The increase was offset partly by a drop of 32.3 percent in fish meal production in the United States. The menhaden catch in the United States in August 1962 was down sharply in the New England, Middle Atlantic, and Gulf States.

Peru accounted for 29.6 percent of world fish meal production (for countries listed) in August 1962, followed by the United States with 19.8 percent, and Iceland with 16.4 percent.

During the first eight months of 1962, Peru accounted for 45.1 percent of total fish meal production, followed by South Africa with 13.1 percent, and the United States with 12.7 percent.



Argentine Republic

JOINT JAPANESE-ARGENTINE
TUNA FISHING VENTURE:

A Japanese company late in August 1962 was reported planning to dispatch its

tuna vessel Eikyo Maru (270 tons) to fish tuna jointly with a local firm in Argentina. The plan hinged on obtaining permission from the local government and completion of necessary arrangements. The application filed by the Japanese firm was approved by the Japanese Overseas Investment Liaison Council. The Eikyo Maru's departure was expected at the end of August or the first part of September 1962. (Suisan Tsushin, August 25, 1962.)



Australia

WESTERN AUSTRALIA BEGINS
EXPORT OF SHRIMP:

An initial shipment of 8,000 pounds of "tiger" shrimp from Western Australia's new Shark Bay shrimp fishery has been consigned to the United States. The shrimp were cooked and packed at sea. They averaged 7 inches in length. Shrimp from Shark Bay are counting 15 to 16 (heads-off) to the pound. The "tiger" shrimp will also be exported to France as "prawns."

The new Shark Bay shrimp fishery is based at Carnarvon. No local fishing vessels will be allowed to fish in the area without the approval of the Fisheries Department because the Government wishes to avoid overfishing. The Western Australian Government has stated that shrimp trawlers from other Australian States will not be allowed to fish in Shark Bay unless the vessels are purchased by or chartered to approved fishermen. The statement was made after a Queensland seafood processor said that some 50 trawlers might be sent from Sydney to Western Australia.

The shrimp industry on the east coast of Australia is well developed and employs 300 boats. The possibility that the shrimp potential in waters off the West Coast may equal that of the East Coast has stirred considerable interest.

A Tasmanian fisherman recently returned from Japan with a description of Japanese shrimp fishing methods in the East China Sea. He said the Japanese have equipment which tells fishermen the exact depth at which a shrimp net is fishing and just how the net mouth is open.

Australian shrimp fishermen are seeking tariff protection from shrimp meat imported

Australia (Contd.):

from India, China, and Japan. (The Fishing News, September 7, 1962.)

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FISHERIES RESEARCH, DEVELOPMENT, AND ADMINISTRATION DISCUSSED:

A series of proposals on fisheries research, development, and administration were discussed at a meeting of the Australian Fisheries Council in October 1962. Attending the meeting were the six State Ministers responsible for fisheries, and the Commonwealth Ministers for Territories and Primary Industry. The two remaining members (the Minister for Trade, and the Minister for the Commonwealth Industrial and Scientific Research Organization) of the Council were not in attendance.

The meeting discussed the necessity for uniform regulations for the management of fisheries, with special attention given to the spiny lobster or crayfish industry of the southeastern coast. This proposal was referred for study to a special meeting in the near future of representatives of the states of New South Wales, Victoria, Tasmania, and South Australia, the Commonwealth Scientific and Industrial Research Organization, and the Department of Primary Industry.

The Ministers agreed to continue training courses for fisheries field officers, and to provide additional information on the fishing industry essential for efficient administration and research. It was also agreed to request the Department of Primary Industry and the Commonwealth Scientific and Industrial Research Organization to do research on the problems of handling, transportation, storage, and processing of fish and to investigate the requirements for fishing gear in Australia. The meeting also agreed to take action against noxious fish, especially the European carp.

The Minister for Primary Industry advised the meeting that funds would be provided to finance an earlier proposal by the Ministers to sponsor a visit to Australia by an expert on fishing boat design, to consult with the industry in all states and New Guinea.

In the opening address, the Chairman of the conference, the Minister for Primary

Industry, reviewed highlights of Australia's fisheries production in fiscal year 1961/62.

Spiny Lobster: Production reached 27.9 million pounds, only a small increase over 1960/61. Of the total fisheries exports for the year, 96 percent by value was spiny lobster, of which the great proportion was sent to the United States. There has been little change in spiny lobster production in the last three years.

Tuna: The Australian catch in 1961/62 totaled 5,457 metric tons, a new record and an increase of 12 percent over the previous year. Experimental tuna fishing off the southwest Australian coast failed to find tuna in commercial quantities. The domestic industry was further protected in 1961 from tuna imports, mainly from Japan, by a tariff increase for the most favored nation category. Despite the increase; however, imports of canned tuna have continued to rise.

Salmon-Trout: A record canned pack of 5.8 million pounds in 1961/62 showed a considerable improvement over the previous year.

Oysters: Production increased by nine percent in 1960/61 for a total of over 14 million pounds.

Imports of fishery products were still high in 1961/62 at £A8.5 million, but were below the level of the previous year of £A9.7 million. This reduction occurred primarily in canned products and was only partially offset by a small increase in frozen fish imports. (United States Embassy, Canberra, October 12, 1962.)

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TAGGING RESULTS IN AUSTRALIAN WATERS:

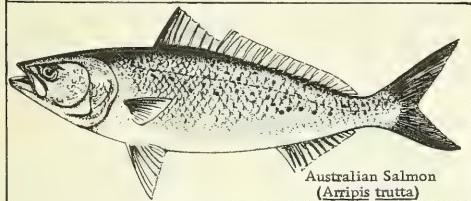
Twelve different tags or marks have been applied to 183,113 aquatic animals (whales, fish, crustacea, and shellfish) in Australian waters. Recoveries as of mid-1962 total 9,918 (5.5 percent). This is stated by the CSIRO Division of Fisheries and Oceanography.

Bluefin Tuna: The information on movements is not clear-cut, except that one fish was recaptured in South Australian waters some hundreds of miles from the tagging place off southern New South Wales, indicating that the southern and eastern stocks may be one.

Australian (Contd.):

Sea Mullet: The sea mullet program has been very successful in showing the pattern both of short-term local movements and longer-term migration paths. Valuable data on growth rates have been obtained. The Queensland study shows movements at the northern end of the mullet's range consistent with the pattern further south indicating that the adult mullet do not return southwards. There were no returns from the South Australian study, so no proof of either independence or homogeneity with eastern or western stocks has been obtained.

Australian Salmon (Trout): The tagging program has shown conclusively that the two stocks or subspecies mingle in the nursery areas of Bass Strait, but that, as maturity



nears, the western subspecies moves westward along the coast of South Australia to Western Australia where it spawns, whereas the eastern subspecies remains in the vicinity of the eastern end of Bass Strait and spawns off southeastern Australia.

School Shark: The pattern of movements of young and adult sharks in the southeastern Australian waters has been demonstrated. The school sharks of South Australian, Victorian, Tasmanian, and New South Wales waters form one intermingling stock, with free interchange across the range of distribution. It is not known to what extent there is continuity with the school sharks of southwestern Australia, because no fishery for the species exists in that area.

Western Spiny Lobster: Punch marking of western spiny lobsters proved beyond any doubt the fact believed by scientists on anatomical grounds, but disbelieved by a majority of fishermen, that the white spiny lobster are a growth phase of the normal red type. Continuous fishing tests to estimate the intensity of fishing have been carried out suc-

cessfully and data on short- and long-term movements have accumulated.



Two specimens of Australian spiny lobster.

Humpback Whales: Whale marking has shown that some degree of intermingling takes place between two humpback populations previously considered to be distinct. (Australian Fisheries Newsletter, September 1962.)



Brazil

NEW SHRIMP PROCESSING AND EXPORTING COMPANY:

The establishment of a shrimp processing and export company in Paranagua on the southeastern coast of Brazil is being considered by a Brazilian group. The Brazilian group is seeking financing for the proposed new shrimp company, according to Curitiba newspaper reports of September 4, 1962. The Governor of Parana State, Brazil, has been informed of the technical plans for the new shrimp company. (United States Consulate, Curitiba, October 5, 1962.)



Canada

FROZEN FISH TRADE

MISSION TO EUROPE:

Seven members of the Canadian frozen fish industry left Ottawa on September 28, 1962, on a 5-week Frozen Fish Trade Mission to Europe. The main purpose of the mission is to examine in detail the European market for frozen fishery products. It is also hoped that the mission will focus the attention of European buyers on Canada as a dependable supplier of top-quality frozen fish, according to a press release by the Canadian Minister of Trade and Commerce of September 26, 1962. With the cooperation of Canadian Trade Commissioners in London, Paris, Hamburg, and Rome, members of the mission will visit leading importers of fishery products and government fisheries officers in important market and producing centers. The members of the mission will also see processing methods now used by frozen fish plants in Europe. The salt-fish industry will be examined briefly by visits to salt-fish plants in France and salt-fish importers in Italy.

The mission includes frozen fish industry representatives from the Provinces of Newfoundland, Nova Scotia, Quebec, and British Columbia, as well as a representative of the Canadian Labor Congress. The mission will be accompanied by a member of the Economics Service of the Canadian Department of Fisheries, and the Chief of the Fisheries Division in the Agriculture and Fisheries Branch, Department of Trade and Commerce, Ottawa.

Expanding European markets are open to Canadian frozen fish processors, the Minister of Trade and Commerce pointed out in announcing the mission. The United Kingdom removed import restrictions on fresh and frozen fish late in 1959. Canadian sales of frozen cod fillets and blocks to the United Kingdom jumped from 1.1 million pounds in 1960 to nearly 7 million pounds in 1961 and may set new records this year. The sale of frozen foods has greatly increased in other European countries and importers have shown considerable interest in Canadian quality fish products. (United States Embassy, Ottawa, October 1, 1962.)

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PRICE DISAGREEMENT TIES UP BRITISH COLUMBIA HERRING FLEET:

About 80 British Columbia herring fishing vessels tied up on October 16, 1962, when some 640 Vancouver fishermen were idled because of disagreement on prices for the new herring fishing season. The fishermen want an ex-vessel price of \$16.00 a short ton for seine-caught herring going into reduction and \$20.00 a ton (or 1 cent a pound) for herring sold as food fish (for canning, salting, and other purposes). Also \$30.43 a ton for trawl-caught herring for reduction purposes but to include all costs of fuel, vessel, and net shares.

The British Columbia Fisheries Association has offered the same prices paid the herring fishermen last season--\$10.40 a ton for reduction herring, and \$16.00 for herring used as food. The price dispute was not settled as of October 17, 1962. (United States Consulate, Vancouver, October 17, 1962.)

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NEW RESEARCH VESSEL "G. B. REED" LAUNCHED:

A broadened program of biological and oceanographic research in Northeast Pacific waters was envisaged at the launching in the summer of 1962 of the G. B. Reed, Canada's first large fisheries research vessel on the Pacific coast. The G. B. Reed is a sister-ship to the A. T. Cameron, in service on the Northwest Atlantic. Both vessels are operated by the Fisheries Research Board of Canada.

While smaller vessels have for several years provided yeoman service to the Board's biological station and oceanographic unit at Nanaimo, B. C., this service has been limited by the vessels' range, accommodations, and scientific facilities. The G. B. Reed will give vastly improved conditions. She will have a cruising range of 8,500 miles; accommodations for nine scientists; and five laboratories furnished with the latest in scientific paraphernalia.

The Director of the Nanaimo Biological Station at the launching ceremony said the construction of the new research vessel was a sign of the times. "All over the world nations are looking more and more to the sea for the food supplies of the future. Canada

Canada (Contd.):

is no exception. We have a very real stake in the resources off our coasts . . . there can be no doubt of our long-term interest in these resources, and no doubt of our increasing use of them."

Canadian fisheries research in the Pacific has expanded seaward particularly since 1953 when Canada became a member of the International North Pacific Fisheries Commission. Biological and oceanographic investigations on the high seas have produced "exciting new knowledge of where our salmon are" and have turned the northeast Pacific from one of the least known to one of the best known oceans in the world, said the Director. ". . . But we have only scratched the surface. There is still much more that is mysterious than is known in the ocean. Not only our own scientific curiosity but the pressure of economic and international problems urges us to turn ignorance of the ocean's resources into useful knowledge. The G. B. Reed will help us to do this."

Immediate plans for the G. B. Reed include a first look at the groundfish stocks in the northeast Pacific, where an international trawl fishery seems imminent. Future projects in which the new research vessel will figure may include studies of high-seas distribution of salmon stocks and ocean productivity. The vessel will also be used in exploratory fishing operations which may reveal new fisheries resources capable of supporting commercial operations.

The G. B. Reed has an over-all length of 177 feet, a breadth of 32 feet, and a loaded draft of 12 feet 10 inches. Her design is similar to east coast commercial trawlers whose sturdy, dependable characteristics under virtually all weather conditions are favorably known. In place of the usual large fish hold, the G. B. Reed is equipped with laboratories and electronic equipment. She also has special fishing gear, winches, and rigging enabling her to carry out a wide variety of exploratory fishing operations. She will carry a complement of 36, including crew and scientific personnel. Her hull is constructed of stiffened steel while the superstructure is aluminum. (Trade News, September 1962.)

Note: See Commercial Fisheries Review, February 1962 p. 62.

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PACIFIC SALMON TAGGING:

Field operations by the four vessels chartered by the Fisheries Research Board of Canada for tagging Pacific salmon on the high seas were concluded by August 1962. Between early April and late July the vessels, using Japanese long-line gear, caught 19,500 salmon, of which 17,500 were tagged and released. All species of Pacific salmon, plus steelheads, are represented in the figures. Through August and early September 1962 more than 300 tags had been returned to the Research Board's Biological Station at Nanaimo, B.C., from localities extending from the Columbia River to Western Alaska.

Very small hooks are used to catch the fish for tagging, so that they can be released in good condition. The amount of information that can be obtained from this large program and especially the knowledge of the whereabouts of the major British Columbia salmon stocks in the ocean will depend to a great extent on the cooperation of all those who find tags. Fishermen, shoreworkers, and others are invited and urged to play their part in this important program by turning in all tags promptly to the Research Board's Biological Station at Nanaimo, to fisheries officers, or to cannery bookkeepers. (Trade News, September 1962, Canada's Department of Fisheries.)

**Ceylon****FISHERY TRENDS AND FOREIGN INVESTMENT POSSIBILITIES:**

There may be opportunities for carefully planned investments by United States firms in Ceylon's changing fishing industry. Such investments would involve some unknown factors which would need careful examination. Ceylon may have abundant fishery resources, but they are largely unexplored. In 1960, Ceylonese landings totaled only 48,222 metric tons, while imports of fishery products amounted to 132,341 tons. The policy of the Government of Ceylon in regard to nationalization of businesses and repatriation of investments and profits is not clearly known and would need careful study by potential investors.

The Government of Ceylon is interested in foreign investments that would bring modern fishing equipment and technical skill to Ceylon. The Government hopes the Ceylonese can learn modern fishing techniques through participation in joint fishing ventures with foreign firms. The Government is aware of the need for regulations which will permit business interests to operate without undue restrictions. Some Ceylonese groups have shown an interest in joining with American firms to carry on fishery operations.

The Director of Ceylon's Fisheries Department has stated that his department will assist potential foreign investors in investigating fishery opportunities in Ceylon. The present Government budget includes a request for a 70-foot fishery

Ceylon (Contd.):



FAO fishery expert back in 1955 views some of the outriggers still used by fishermen on Ceylon's east coast.

research vessel. It is estimated that the vessel would cost Rs. 500,000 (US\$105,130). It would be capable of carrying out research and exploratory fishing in waters up to 400 miles from Ceylon. The Fisheries Department has been limited in the past by a shortage of research equipment.

A shortage of harbors has handicapped fisheries development in Ceylon. The Port Commission of Ceylon is building a harbor at Galle that will have 1,200 feet of alongside dock space for fishing vessels needing less than 20 feet of water. According to news reports, the Government plans to build 16 other new harbors. The minimum construction time for the 16 new harbors is estimated at from 2 to 3 years.

Ceylon has sought foreign aid in developing Galle harbor as a base for a tuna long-line fishing venture. It was hoped that a foreign investor would develop shore facilities at Galle for processing fish, furnish vessels, train the Ceylonese in modern fishing techniques, and eventually transfer all interest in the venture to the Ceylonese. The response to the Galle proposal is not known.

Ceylon has cold-storage facilities at Mutwal where two trawlers are based. According to a recent Government report, the cold-storage facilities at Mutwal must be expanded if additional trawlers are to be accommodated. Negotiations were reported to be taking place with Poland and Yugoslavia for the purchase of five trawlers, but it was later reported that the purchase may be limited to one under Yugoslav credit.

A United States company that wishes to import frozen spiny lobster tails from Ceylon has been negotiating a limited joint venture with a private Ceylonese group. The abundance of spiny lobsters in Ceylon's coastal waters is the subject of conflicting reports.

The joint firm formed by Japanese and Ceylonese interests in 1961 is now engaging in tuna fishing. The tuna is sold in Ceylon as fresh fish, but the company is completing its own freezing plant and will later undertake canning. The Japanese also fish independently in waters accessible to Ceylon and take the fish to Japan for processing and export.

In May 1962, a representative of a British firm was in Ceylon surveying the opportunities for bringing vessels and equipment to fish Ceylonese waters. He was quoted in the press as being impressed, but nothing further had developed as of mid-September 1962.

Ceylon's Fisheries Department is heavily involved in administering the mechanized vessel plan which is now in its

fourth year of operation. The United States Agency for International Development (AID) has provided Rs. 2,300,000 (US\$483,600) in local currency to support the plan. Under the plan, the Government finances the building and equipping of small 2-ton mechanized boats suitable for fishing the nearby waters. A total of 1,199 had been built by September 1962 at an average cost of Rs. 17,500 (US\$3,680) per boat including gear. The range of operation is considerably more than that of the native outrigger nonmechanized craft. In addition, there is a plan for providing outboard motors for 300 traditional craft per year.

While fish catches have increased, the increase has not met expectations and there have been many problems of boat maintenance and operation. Many borrowers have not carried through with their loan agreement. Some consideration has been given to reducing the rate of repayment. A factor in the rate of repayment is that the fisherman considers the loan in the nature of a subsidy from the Government. The rate of recovery reported for loans made in 1958-59 is 31.6 percent. The record for succeeding years ranges from 16 to 18 percent. Present plans call for more vigorous efforts to inspect vessel operations and supervise loan collections. (United States Embassy, Colombia, August 24 and September 17, 1962.)



Chile

FISHERIES TRENDS, SEPTEMBER 1962:

Fish Meal Industry Continues to Expand: Corporacion de Fomento de la Produccion de Chile (CORFO) is studying a proposal by a foreign concern to invest up to US\$5 million in a new fish meal plant at Arica.



Crew of Chilean fishing trawler lowering their net off of Valparaiso.

In September 1962, two new fish meal plants began operating on an experimental basis in northern Chile. They are expected to start full production upon completion of machinery tests and clearance by national

Chile (Contd.):

health authorities. One of the new plants is located in Iquique and reportedly represents an investment of about US\$1 million. With full production it should be able to process 400 metric tons of anchovies daily. Raw material will be supplied by a fleet of eight fishing vessels of 110-ton capacity. Two of the vessels were due to arrive in Iquique during September.

The other new plant is located in Pisagua. It represents a joint venture of Chilean and Norwegian capital reportedly amounting to more than US\$1 million. The plant will process fish meal and will freeze fish products for sale in local and foreign markets. It will have an average operating capacity of 60 tons of raw material per hour. Raw material is presently being supplied by the Norwegian fishing vessel Senior (400 tons). Additional fishing vessels are due to arrive from Norway in 1963.

CORFO announced in late August 1962 the approval of new loans valued at over US\$2,135,400 for the installation of other new fish meal plants in Iquique and Arica and the purchase of a number of 100-ton fishing vessels to supply the plants. The loans will include United States dollar credits of \$240,000 and the balance will be extended in Chilean currency.

Proposal to Resettle Some Italian Fishermen in Chile: During September 1962, representatives of the Food and Agriculture Organization (FAO) visited Northern Chile to study the possibility of settling Italian fishermen at ports in the area. There has been, as yet, little reaction to the proposal. The FAO representatives stated that the Italian fishermen would not displace Chileans and would not engage in any business except fishing. (United States Consulate, Antofagasta, September 28, 1962.)



Denmark

FISH FILLETS AND BLOCKS AND FISHERY INDUSTRIAL PRODUCTS EXPORTS, JANUARY-AUGUST 1962:

Denmark's exports of fresh and frozen fillets and blocks during the first eight months of this year were 17.1 percent greater than in the same period of 1961, mainly because of an increase of 132.8 percent in exports of herring fillets. Exports of flounder and sole fillets increased 14.6 percent,

but exports of cod and related species declined 7.5 percent. During the first eight months of this year exports to the United States of fresh and frozen fillets and blocks of about 9.6 million pounds (mostly cod and related species) were up from the exports of about 9.2 million pounds in the same period of 1961.

Denmark's exports of fresh and frozen fish fillets and blocks during August 1962 were 14.8 percent above exports in the same month in 1961. Of the total exports, about 0.5 million pounds (mostly cod and related species) were shipped to the United States in August 1962 as against 0.3 million pounds in the same month of 1961. The leading buyers of frozen fillets in August 1962 were the United Kingdom and the Federal Republic of Germany.

Product	August		Jan.-Aug.	
	1962	1961	1962	1961
<u>Fillets and Blocks:</u>				
Cod and related species ..	1,451	1,597	22,577	24,386
Flounder and sole	3,330	2,761	17,888	15,612
Herring	1,891	1,421	13,942	5,988
Other	30	59	477	887
Total	6,702	5,838	54,894	46,883
<u>Industrial Products:</u>				
Fish meal, fish solubles, and similar products	9,524	6,750	48,655	27,618

^{1/}Shipments from the Faroe Islands and Greenland direct to foreign countries not included.

Denmark's exports of fish meal, fish solubles, and similar products in January-August 1962 were 76.2 percent greater than in the same period a year earlier. Exports to the United States during the same period were 110 tons in 1962 as against 28 tons in 1961.

During August 1962, Denmark's exports of fish meal, fish solubles, and similar products were 41.1 percent above the amount shipped out in the same month of 1961. The principal buyers were the United Kingdom and West Germany. Only 110 tons were shipped to the United States.

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U. S. MAY GET FILLETS FORMERLY SOLD TO EAST GERMANY:

Denmark's annual sale of about 2.2 million pounds of frozen cod fillets to East Germany will not occur this winter. The Danish delegation returning from negotiations in Liepzig late in September 1962, reported that the East Germans refused to pay any increase over the prices in the previous contracts. These prices will not cover their costs, according to the Danes.

Since Denmark has a good market for fillets in the United States and the United Kingdom, it is probable the quantity formerly going to East Germany will be diverted to those markets. Offsetting the loss of the East German market is the announcement that, during the winter, it is expected that the Blue Peter line, a German shipping firm, will maintain

Denmark (Contd.):

monthly refrigerated ship transport from Danish ports to the United States. Its vessels will carry poultry from the United States to Germany and frozen fish westbound. (European Regional Fisheries Attaché, United States Embassy, Copenhagen, September 26, 1962.)

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FISHERY EXPORTS,

JANUARY-AUGUST 1962:

Denmark's total exports of fishery products in the first eight months of 1962 were 22 percent greater in value than in the same period in 1961, the record year for exports. Similarly, exports to the United States were up about 20 percent in value. (European Regional Fisheries Attaché, United States Embassy, Copenhagen, September 26, 1962.)

Danish Exports of Fishery Products, January-August 1962 and 1961										
Item	1962			1961						
	Qty.	Value	Qty.	Value	Metric Tons	Million Kr.	US\$ 1,000	Metric Tons	Million Kr.	US\$ 1,000
Total exports	190,100	356.6	51,707	167,500	291.9	42,326				
Exports to U.S.	6,700	27.7	4,017	5,800	23.0	3,335				

Note: Values converted at rate of one Danish krone equals US\$0.145.

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FISH-REDUCTION PLANT

ODOR CONTROL STUDIED:

Because of steadily increasing complaints to health commissions throughout Denmark and a request from the Ministry of Fisheries, the Akademiet for de Tekniske Videnskaber (The Academy for the Technical Sciences) in Copenhagen established a Fiskeligtudvaag (Fish Odor Committee) in 1956 to investigate the odor problems arising during the manufacture of fish meal and fish oil, the United States Regional Fisheries Attaché in Europe reports. The Committee's objective was to obtain information on odor elimination in Denmark and foreign countries and to conduct research to the degree that proposals could be made for effective odor control. The Committee's work was completed earlier this year in the form of a report and the construction of a deodorizing installation in a small Danish fish-reduction plant which operates satisfactorily by burning the odor-containing gases. Also initiated was further experimentation, still under way, in Denmark's largest fish-reduction plant, located in Esbjerg.

The Committee's report, published by the Academy, is entitled *Bekæmpelse af Lugtplage* (Fight against Odor Problems). It is a 167-page, illustrated, mimeographed report in Danish, containing 13 chapters and a list of 81 references on odors and odor elimination. The various chapters discuss such matters as: physiology of the sense of smell; fish odors; research on properties of fish odors; fish meal manufacture and sources of odors; diffusion of odors; deodorizing methods; deodorizing by burning; experiences with an experimental odor-burning installation; subjective examination of odors in plant area; deodorizing of raw material storage bins; design of odor-burning and deodorizing installations; absorption of fish odors.

In a summary, the Committee estimated that, in a plant, 60-80 percent of the odors came from the drying operation, 10-20 percent from the cooking operation, the same percent-

age from internal transportation of the raw material, and 2-5 percent from particles of dried meal in the air. Burning the odor-containing gases from plant operations appeared to be the cheapest solution to the odor problem. The Committee also stressed the need for controlling odors during the unloading and storage of raw material, suggesting future research in this field. Raising the quality of the raw material to that of fish for human consumption was mentioned as the most effective control method but recognized as not currently possible. Greater use of ice and other preservatives was recommended. It was stated that deodorizing methods capable of handling very large quantities of gases should be developed, and absorption in sodium hypochlorite offered significant possibilities. Odor control in the recently-installed spray-drying plants was reported to be the subject of a joint study by the Ministry of Fisheries and Denmark's largest reduction plant in Esbjerg.

Advances in odor suppression in fish meal and oil plants have been made at the large cooperative reduction plant—Andelsfiskeoliefabrikken—in Esbjerg since the lengthy report is issued earlier this year by the Fish Odor Committee of the Academy for the Technical Sciences, according to an interview with the production manager reported in *Vestkysten*, an Esbjerg daily paper. During work with the experimental installation based on the report, it was found that the bad odors were bound to quite small particles which went out the smokestack. The new development is the discovery that an oil bath can be added in the closed circuit after the water bath and filtering devices. The odor apparently can be bound completely in the ordinary Diesel oil used in the oil bath. The Diesel oil may be used later for the usual purposes as it is not affected by its use as a cleaning agent. When the Diesel oil is burned, the odor particles disappear completely.

A larger experimental installation is to be constructed by a new Danish company, "Chemical Research Organization" (CRO), which operates entirely on a research basis. The CRO has supplied a newly developed Danish instrument which is one of the first in the world which is able to indicate bad odors. The apparatus was developed by Lava Olsen, an engineer in the Technological Research Laboratory of the Danish Ministry of Fisheries. The apparatus is built on a spiral principle and has been invaluable in the odor-elimination research. (European Regional Fisheries Attaché, United States Embassy, Copenhagen, September 24, 1962.)

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FISHERY LANDINGS IN DANISH PORTS, JANUARY-AUGUST 1962:

Landings of fish, crustaceae, and mollusks in Danish ports in 1962 were 21 percent ahead of 1961 for the first eight months and seven percent ahead of 1959, the record year for landings. Catches in all the important categories have been as good as, or better

Landings of Fish, Crustacea, and Mollusks in Danish Ports, January-August 1962, 1961, and 1959			
Species	January-August		
	1962	1961	1/1959
Plaice, dabs, & flounders	37.9	37.3	28.6
Cod	46.1	48.6	45.5
Herring	199.5	174.5	199.2
Bisling	5.9	5.6	3.6
Crustacea2/	4.2	3.8	2.9
Other3/	261.9	188.3	238.7
Total	555.5	458.1	518.5

1/Year of record total catch—667,800 tons.
2/Mostly deep-water shrimp and Norway lobster.
3/Mostly sand eels or launce, spling, whiting, and other fish for reduction to meal and oil, and for trout and animal food.

Denmark (Contd.):



Danish fisherman standing on a typical live box or float in which live plaice are held for marketing. In 1961 live plaice ex-vessel price was 10.8 cents a pound. Fish shops throughout Denmark carry live plaice.

than, in 1959. (European Regional Fisheries Attaché, United States Embassy, Copenhagen, September 26, 1962.)



Fiji Islands

TUNA BASE APPROVED BY
JAPANESE GOVERNMENT:

The Japanese Government, on September 3, 1962, approved the establishment of the South Pacific Ocean Fisheries Cooperative Association, which was organized for the purpose of managing the tuna base to be jointly established at Levuka, Fiji Islands, with British interests. The Association, which plans to operate thirty 99-ton medium tuna vessels during the first year of operation, reportedly is seeking a vessel tonnage allocation of 3,000 metric tons for the base and hopes to secure a minimum of 2,000 tons. The Japanese Government was expected to grant the tonnage allocation sometime in October this year. (Japanese periodicals *Hokkai Suisan*, September 3, *Nihon Suisan Shim bun*, September 7, 1962.)

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FISHERIES DIVISION
TO BE ESTABLISHED:

The Fiji Department of Agriculture plans to establish a fisheries division. It will undertake the study of marine fishing techniques, the regulation and stocking of inland fisheries, the preparation and implementation of fisheries legislation, the study of fish marketing problems, and to a limited extent will carry out fisheries research. (*South Pacific Bulletin*, July 1962.)



Ghana

ECONOMIC COOPERATION WITH JAPAN:

A Ghanaian firm will charter six trawlers from a Japanese fishing company, according to newspaper reports in Ghana. The purpose of the vessel charter agreement was described as "the development of a deep-sea fishing industry in Ghana." The Ghanaian firm may purchase the vessels if fishing is profitable.

Ghana and Japan signed an economic and technical cooperation agreement on September 24, 1962, in Tokyo, Japan. As an initial undertaking, the Japanese Government is to establish a training center in Ghana and will provide teaching aids, materials, and machinery, as well as technicians and teaching staff. (Editor's note: Although details are lacking, it seems probable that Japanese technical assistance to Ghana will include aid to Ghana's fishing industry.) The agreement calls for the award of grants to enable Ghanaians to study in Japan. The Japanese Government will also send experts to encourage the economic and technical development of Ghana. It is understood that the cooperation agreement is for 5 years. (United States Embassy, Accra, October 9, 1962.)

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SIX FISHING VESSELS TO BE
PURCHASED FROM JAPAN:

According to an announcement in *The Ghanaian Times*, Ghana will purchase six fishing vessels from Japan. The announcement was made by Ghana's Minister of Agriculture, following consultations with a delegation of Japanese fishing experts. A two-man delegation was expected to leave for Tokyo to conclude the purchase on behalf of the Ghana Fishing Corporation, the Minister

Ghana (Contd.):

said. (United States Embassy, Accra, October 7, 1962.)

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SOVIETS LAND FISH IN GHANA:

The landing at Tema of 500 metric tons of fish from the Soviet fishing vessel was reported by the local press in September 1962. The consignment was accepted for a Ghana fishing corporation by the Minister of Agriculture, who announced that a second consignment of 2,500 tons was expected. The local representative of the Soviet Foreign Trade Corporation for Foodstuffs said that his organization would supply the Ghana firm with 2,000 tons of fish every month. A fleet of 25 Soviet vessels (including three with refrigeration facilities) were fishing off the west coast of Africa in September 1962, the Soviet official stated.

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**SOVIETS TO DELIVER
FISHING VESSELS:**

Three of the ten fishing vessels ordered by Ghana from the Soviet Union under a £G1,670,000 (US\$4.7 million) agreement signed on August 26, 1961, will be delivered in 1963. The first, cited as the Pioneer, a trawler of 900 tons deadweight, was launched at the Leninskaya Kuznitsa shipyards in Kiev and is expected to arrive in Ghana in June 1963. The vessel is stated to have a speed of 13 knots, a range of 37 days, and modern navigation and refrigeration equipment. The vessel will be manned by a Soviet crew who will train Ghanaian replacements. Ghana's Minister of Agriculture announced that 80 Ghanaians were expected to leave shortly for the Soviet Union to learn how to operate the new fishing craft, according to the local press. (United States Embassy, Accra, September 25, 1962.)

Note: See Commercial Fisheries Review, October 1962 p. 55.

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**GHANAIAN FISHERMEN TRAINED
TO USE PURSE SEINES:**

United States fishermen assisted by two British fishermen trained Ghanaian fishermen on the four new seiners purchased from a British shipyard. Fishing is being done in equatorial waters with seines 2,700 feet long and 276 feet deep. Catches ranging up to 135 tons per set have included tuna, sharks,

swordfish, rays, sea turtles, and barracuda. (Fishing News, British fishery periodical, August 24, 1962.)

**Greece****OUTBOARD MOTORS DONATED
TO GREEK FISHERMEN:**

Ten United States manufactured outboard motors for use in fishing vessels were donated by CARE to Greek fishing cooperatives in two small villages in northern Greece. The motors were distributed among needy fishermen who formerly were able to fish only a short distance away from shore. With engines in their fishing craft, they will now be able to fish up to about three miles offshore.

Representatives of CARE and the United States manufacturer of the outboard motors delivered the equipment to the cooperatives which were selected by the Greek Agricultural Bank and the Director of Fisheries of Greece's Ministry of Industry. (Alieia, Athens, Greece, August 1962.)

**Iceland****FISHERIES TRENDS,
LATE SEPTEMBER 1962:**

Trade with Communist Bloc Countries: Communist Bloc countries have engaged in barter trade with Iceland and then sold Icelandic barter trade exports to Western European countries for hard currency. The disclosure appeared in the Icelandic independent newspaper, Morgunblaðið, of September 22, 1962. Specific examples cited included the sale by Hungary of Icelandic frozen fish in Austria. The newspaper article was part of a series pointing out the disadvantages of barter trade with Communist Bloc countries.

Iceland plans to import a dozen 20-ton motor fishing vessels from the U.S.S.R. The first of the vessels arrived in Iceland on board an Icelandic merchant ship. The vessels will be fitted out with motors of British manufacture. Iceland has obtained fishing vessels from East Germany, but this is the first import of Soviet-made vessels. The Soviet vessels will be subject to clearance for seaworthiness by the Director of the State Ship Inspection Service.

Iceland (Contd.):

Thorlakshofn Harbor Project: The economic importance of developing a harbor at Thorlakshofn on Iceland's south coast has been stressed by leaders inside and outside the Government. But all sorts of delays have plagued the start of such a project. After bitter controversy over which firms should receive the Thorlakshofn harbor contract, the Lighthouses and Harbors Administration early this year made the award jointly to an Icelandic and Danish building firm. Although work was supposed to begin last spring, only preparatory measures had been taken so far. The Central Bank is still negotiating financing with certain New York City banks for all or part of the cost of the \$1,050,000 project. Reportedly the financing will be for 10 years at $6\frac{1}{2}$ percent interest. However, on September 4, 1962, the Central Bank loaned the Harbors Administration 8.6 million kroner (US\$199,700) as a first installment on the project.

Whaling: A total of 483 whales were taken during this year's whaling season by Icelandic whalers, as compared with the catch of 350 whales in 1961. This year's whale catch was surpassed only by the catch of 517 whales in 1957 and 508 whales in 1958. Whalers benefited from good weather this summer. Two whale catcher vessels were bought in Norway this year to replace part of Iceland's fleet of 4 whalers. (United States Embassy, Reykjavik, September 28, 1962.)



Japan

PRICE DROP IN AUGUST 1962 FOR FROZEN TUNA EXPORTS TO U. S.:

The f.o.b., Japan price for frozen tuna exported to the United States started to drop the latter part of July 1962. The Japanese ex-vessel tuna prices also dropped. At about mid-August, the ex-vessel price at Yaizu for yellowfin (20-100 pounds) dropped to US\$271 a metric ton. This was the lowest price in 1962. Compared with the highest price in the recent past, it was nearly \$75 a ton lower.

The following reasons were given for the decline: (a) ship-frozen tuna had increased since the beginning of August; (b) exporters

were selling only fish which they were sure of getting and not as in the past when they were selling futures without adequate stocks; (c) there were no sales negotiations in progress.

When the ex-vessel price dropped to \$276 a ton, Japanese canners began buying. As of mid-August 1962, the ex-vessel price for albacore tuna was still \$376 a ton for good-quality fish. (Suisan Tsushin, August 27, 1962.)

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STATUS OF FROZEN YELLOWFIN TUNA EXPORT QUOTA:

As of July 31, 1962, Japanese production of frozen yellowfin tuna for export to the United States was being carried out faster than last year and exceeded 25,000 short tons. The total production quota this year is 35,000 tons. While there were some firms that had used up their entire quota as of the end of July, others still had 90 percent of their quota left unused, according to figures compiled by the Export Frozen Tuna Fisheries Association.

Under the circumstances, considerable opposition is raised against an increase in the quota at this time. Also, the recent slackening of exports to the United States is causing concern whether or not the remaining 10,000 tons will be used. The Association is inclined to postpone consideration of an increase in the quota for the time being.

But it is believed by some that the year's quota of 35,000 tons for frozen yellowfin tuna is inadequate and sooner or later it must be increased. The Association is of the opinion that it probably will be increased in October 1962. (Suisan Keizai Shimbun, September 14, 1962.)

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FROZEN TUNA EXPORTS TO U. S. DIRECT FROM JAPAN, APRIL-SEPTEMBER 1962:

According to Export Frozen Tuna Manufacturers Association, exports of frozen tuna from Japanese ports to the United States

Frozen Tuna Exports to U. S. Direct from Japan, April-September 1962		
Species	1962	1961
Albacore . . . . .	. . . (Short Tons) . . .	
Yellowfin	10,227 9,138 27,258 18,424	

Japan (Contd.):

from April through September 1962 were substantially higher than during the same period a year earlier.

The exports were reported to have slowed down sharply since mid-August this year.

Note: The Japanese fiscal year begins April 1.

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FROZEN TUNA EXPORTS TO ITALY:

Japanese exports of frozen tuna to Italy reportedly increased since Italy enlarged her frozen tuna import quota from 25,000 metric tons to 40,000 metric tons. Of Italy's total imports of 25,000 metric tons of frozen tuna as of early October 1962, imports from Japan totaled 19,000 metric tons (17,500 tons of Atlantic-caught tuna and 1,500 tons delivered from Japan proper). Price paid by Italy was reported at \$370 per metric ton, c.i.f., which is \$90 higher than the price offered during the same period in 1961.

The Japan Export Frozen Tuna Producers Association foresees a further increase in tuna exports to Italy. Direct exports from Japan proper are also increasing, due to the recent decline in frozen tuna demand in the United States and the lower freight rate now charged by non-scheduled freighters for shipments to Italy. (*Nihon Suisan Shimbun*, October 12, 1962.)

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**EXPORTS OF FROZEN TUNA
TO THE UNITED STATES, 1961:**

Table 1 - Japanese Licensed Exports of Frozen Tuna Transshipped to the United States, 1960-61

Species	1961		1960	
	Quantity	Value	Quantity	Value
	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000
Albacore	10,357	3,151.3	8,923	2,463.0
Yellowfin	18,633	4,213.3	21,193	4,890.0
Other	2,164	484.8	-	-
Total	31,454	7,849.4	30,116	7,353.0

Table 2 - Japanese Licensed Exports of Frozen Tuna to the United States from Japanese Ports by Species and Type, 1961

Type of Products	Albacore		Yellowfin		Big-Eyed		Bluefin		Skipjack		Total all Species	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	Metric Tons	US$ 1,000	Metric Tons	US$ 1,000	Metric Tons	US$ 1,000	Metric Tons	US$ 1,000	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000
Whole Fish	22,250	7,443.3	-	-	200	45.4	-	-	555	121.4	23,005	7,610.1
Processed Fish:												
Fillets	1	0.7	3,289	1,180.5	409	155.1	30	8.0	-	-	3,729	1,344.3
Gilled and gutted .	-	-	24,799	6,897.1	-	-	-	-	-	-	24,799	6,897.1
Loins	1,398	1,057.1	2,606	1,663.5	85	48.3	6	3.8	1	0.6	4,096	2,773.3
Other	10	4.2	\$51	93.8	24	5.4	-	-	-	-	585	103.4
Total	23,659	8,505.3	31,245	9,834.9	718	254.2	36	11.8	556	122.0	56,214	18,728.2

Japanese licensed exports of frozen tuna products to the United States direct from Japanese ports amounted to 56,214 metric tons and included whole fish, gilled and gutted fish, fillets, loins, and other products.

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**EXPORTS OF FROZEN TUNA AND
CANNED TUNA IN BRINE, FY 1961:**

Shipments to the United States accounted for 66.0 percent of the quantity and 69.4 percent of the value of Japanese frozen tuna approved for export in fiscal year 1961 (April 1961-March 1962), according to data released by the Japanese Fisheries Agency.

Japanese Tuna Approved for Export in Fiscal Year 1961		
Item	Quantity	Value
	Metric Tons	US\$1,000
Tuna, Frozen:		
Total Japanese exports	132,900	38,306
Exports to the United States	87,700	26,578
	1,000 Cases	US\$1,000
Tuna, Canned in Brine:		
Total Japanese exports	3,701	29,734
Exports to the United States	2,205	19,179

Shipments to the United States accounted for 59.6 percent of the quantity and 64.5 percent of the value of Japanese canned tuna in brine approved for export in fiscal year 1961. (Minato Shimbun, October 9, 1962.)

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**ELEVENTH SALE OF CANNED TUNA IN
BRINE FOR EXPORT TO U. S.:**

The Tokyo Canned Tuna Sales Company, representing Japanese canners, announced in mid-October 1962 that 130,000 cases of canned tuna in brine (consisting of 75,000 cases of white meat tuna and 55,000 cases of light meat tuna) for export to the United States were to be offered to exporters at the eleventh canned tuna sale. Japanese exports of canned tuna in brine to the United States up to and including the eleventh sale total 2,202,960 cases, thus completely using up the quota of 2,200,000 cases established for this

Japan (Contd.):

year by the Japan Canned Foods Exporters Association for export to the United States.

Some segments of the Japanese tuna canning industry believe that the total quantity of tuna packed in brine that will enter into the United States will fall short of the 1962 United States import quota under the 12½-percent rate of duty by 100,000 to 200,000 cases. United States imports of canned tuna in brine from other countries dropped in 1962. However, in view of the softening of the canned tuna market in the United States, the Japanese Canned Foods Exporters Association is reported to be reluctant to increase the export quota until it has made a careful study of sales of canned tuna in brine on hand and the marketing conditions prevailing in the United States. (*Suisan Tsushin*, October 16, 1962.)

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EXPORTS OF CANNED TUNA IN OIL,
APRIL-JULY 1962:

A total of 298,902 cases of canned tuna in oil were approved for export during April-July 1962, according to data compiled by the Japan Export Canned Tuna Producers Association. This amounts to only 57 percent of the canned tuna in oil exported during the

same period last year when 521,205 cases were sold.

Exports of canned tuna in oil for April-July 1962 by species are shown in table. Exports of yellowfin and big-eyed tuna this year are down substantially. (*Suisan Tsushin*, October 8, 1962.)

Note: Japanese year begins on April 1.

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EXPORTS OF CANNED TUNA
IN OIL, APRIL-AUGUST 1962:

Data compiled by the Japan Export Canned Tuna Producers Association reveals that canned tuna in oil approved for export during April-August 1962 totaled 433,272 cases, about 70 percent of the 618,585 cases exported during the same period in 1961. (*Suisan Tsushin*, October 12, 1962.)

Principal Countries of Destination	Japanese Exports of Canned Tuna in Oil with Comparisons	
	April-August 1962	1961
West Germany	136,069	193,292
Canada	93,189	125,215
Netherlands	38,413	53,750
Belgium	34,982	26,339
England	24,950	32,854
Switzerland	17,785	30,114
Syria	15,889	13,678
Lebanon	13,356	28,531

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EXPORTS OF CANNED FISHERY
PRODUCTS, JANUARY-MARCH 1962:

Total Japanese exports of canned fishery products in January-March 1962 were 50.4 percent higher than in the same period of 1961. The increase was general among most of the important products with salmon and mackerel-pike showing the largest increase.

Japanese Exports of Canned Tuna in Oil, April-July 1962		
Species	1962	1961
(Number of Actual Cases)		
Albacore	76,708	128,934
Yellowfin	4,751	80,777
Big-eyed	98,117	208,424
Skipjack	74,292	34,541
Tuna flakes	45,034	68,529
Total	298,902	521,205

Product	January-March 1962				Jan.-March 1961
	U. S.	Canada	Other Countries	Total	Total
Crab meat					
	35,889	1,425	55,731	93,045	78,419
Tuna:					
In oil	-	41,145	259,109	300,254	285,400
In brine	600,700	-	-	600,700	525,600
Other types	100	25	73,477	73,602	28,423
Total tuna	600,800	41,170	369,586	974,556	839,423
Mackerel-pike	13,185	200	269,974	283,359	91,743
Sardine	7,478	-	27,646	35,124	29,166
Horse-mackerel	-	-	101,825	101,825	112,728
Salmon, trout	51,031	5	626,984	678,220	219,509
Other fish	8,034	2,488	86,024	96,546	87,879
Shellfish	68,819	31,586	17,338	117,743	128,856
Other aquatic products	4,475	80	4,381	8,936	1,253
Grand total	789,711	76,954	1,522,489	2,389,154	1,588,976

¹/Tuna exports reported in standard cases (48 7-oz. cans); other products reported in actual cases.

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Japan (Contd.):

CANNED TUNA IN OIL MARKET IN EUROPE WEAKENS:

Some weakening of the European market for Japanese tuna canned in oil was reported in mid-September 1962. The highest prices obtainable by the Japanese packers for shipments to Europe in September were US\$6.39-6.53 a case. This was a decrease of almost 28¢ a case. As previously reported, skipjack tuna fishing off the Sanriku coast of Japan again became active early in September and the tuna packers were stepping up the packing of "in oil." (Japanese periodical Suisan Tsushin, September 17, 1962.)

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TUNA VESSEL OPERATIONS IN ATLANTIC OCEAN, OCTOBER 1962:

There were 77 Japanese tuna long-liners operating in the Atlantic Ocean as of mid-October 1962--30 vessels more than fished in the Atlantic Ocean during the same period in 1961. Japanese tuna vessels fishing in the Atlantic during January to October 1962 averaged 68 vessels per month as compared with the monthly average of 58 vessels in 1961, 48 vessels in 1960, and 33 vessels in 1959.

Most of the Japanese tuna vessels in the Atlantic Ocean were concentrated in the South Atlantic off the West African coast, where they were primarily fishing for albacore tuna. Unlike the light yellowfin tuna fishing this year in the Atlantic Ocean, albacore fishing was reported to be relatively good. The 500-ton tuna vessels caught an average of eight metric tons of albacore per day.

Because export prices of Atlantic-caught tuna for the United States were down (ranging from \$300 to \$310 a short ton, delivery Dakar), exports of Atlantic-caught tuna to the United States fell-off. Exports to France however, were maintained at a price of around \$430 a metric ton, delivery at French ports of destination. (Suisan Tsushin, October 17, 1962.)

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RESEARCH VESSEL TO SURVEY EASTERN PACIFIC OCEAN TUNA RESOURCES:

In order to investigate tuna resources, the Japanese Fisheries Agency's research

vessel Shoyo Maru (602 gross tons) was scheduled to depart Tokyo on November 1, 1962, on an exploratory cruise to the eastern Pacific Ocean. The waters to be surveyed are located within the yellowfin tuna fishery regulatory area recommended by the Inter-American Tropical Tuna Commission and are bound by the lines intersecting at the following points: 10° N. latitude and 110° W. longitude; 12° S. latitude and 95° W. longitude; 12° S. latitude and 125° W. longitude; 40° S. latitude and 95° W. longitude; 40° S. latitude and 85° W. longitude; 20° S. latitude and 107° W. longitude; 20° S. latitude and 80° W. longitude; 10° N. latitude and 100° W. longitude.

Research objectives are: (1) study geographical distribution and abundance of important fish; (2) study catch composition, catch quantity, and hook rate by fishing area; (3) conduct observations on water depth, water temperature, and current, and relate their effect on catch; (4) study the following fishery conditions at ports of call: (a) economic aspects of port, (b) natural conditions, (c) fishery facilities, (d) local fishing conditions, (e) economic condition of fishing industry, (f) fishery production conditions, (g) marketing and consumption of fishery products.

The Shoyo Maru is scheduled to call at Honolulu (November 16), San Diego (November 29), Callao, Peru (December 31), Valparaiso, Chile (February 8, 1963), and Papeete, Tahiti (March 2, 1963). Date of return to Tokyo is scheduled for March 31, 1963. (Minato Shimbun, October 19; Suisan Keizai Shimbun, October 12, 1962.)

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TUNA EX-VESSEL PRICES AT TOKYO:

The following ex-vessel prices were reportedly paid on October 18, 1962, for 160 metric tons of tuna and tuna-like fish landed in Tokyo by the Sakura Maru No. 8. (Suisan Keizai Shimbun, October 23, 1962.)

Tokyo Ex-Vessel Tuna Prices, October 18, 1962		
Product	Yen/Kg.	Price US\$ Short Ton
Yellowfin (Gilled & Gutted):		
Special large (over 120 lbs.) . . .	95	239
Large (100-120 lbs.)	102	257
Small (20-80 lbs.)	107	270
Albacore (gilled & gutted)	133	335
Fillets:		
Yellowfin	122	308
Big-eyed	132.6-134	334-338

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Japan (Contd.):

NEW REGULATIONS FOR PORTABLE-VESSEL-CARRYING TUNA MOTHERSHIPS:

The Japanese Fisheries Agency announced, on September 12, 1962, new regulations governing the operation of portable-vessel-carrying tuna motherships, effective September 11. Under the new regulations, existing portable-vessel-carrying motherships, all of which are vessels of less than 2,000 gross tons, will be classified as Class I portable-vessel-carrying motherships and those of 2,000 gross tons or more will be classified as Class II portable-vessel-carrying motherships. Class II motherships differ from Class I motherships in that the motherships in that category will not be permitted to engage directly in fishing. Reportedly, the new category was established primarily to provide a more rational vessel tonnage replacement system for that type of fishery, and thereby improve its management.

At the present, there are a total of 24 large tuna vessels, ranging in size from 471 tons to 1,913 tons gross, of which 17 are over 1,000 tons, registered as Class I portable-vessel-carrying tuna motherships. The number of portable vessels (under 20 tons gross) carried by those motherships range from 1 to 6 each, or a total of 67.

Following the Fisheries Agency's announcement, a large fishing company was reported to be planning on dispatching the Banshu Maru No. 5 (3,700 gross tons) to the Indian Ocean fishing grounds as a Class II mothership, carrying eight portable catcher vessels. The vessel was scheduled to depart Tokyo on September 22 for the fishing grounds off Madagascar in the Indian Ocean, where fishing of albacore and yellowfin tuna was reported good. The catch target is 2,400 metric tons of tuna.

Concerning the Class II portable-vessel-carrying motherships, the company's chief of fishing vessel operations commented as follows: "This type of mothership operation, in which only 20-ton portable vessels are employed in actual fishing, becomes difficult when a storm occurs at sea. However, the 20-ton portable vessel can achieve the same catch efficiency as that of a 100-ton tuna vessel, so this type of fishing operation greatly improves management efficiency of mothership-type fleet operation. Moreover, there is the advantage of mobility."

At least three more large Japanese companies are planning to operate Class II motherships in the Indian Ocean. The motherships to be used are: the Keijo Maru (3,500 gross tons); the Ishiyama Maru (3,300 gross tons); and the Kazushima Maru (3,800 gross tons). Each of those motherships will carry at least eight portable catcher vessels. (Japanese periodicals Suisan Keizai Shimbun, September 13, 1962; Suisan Tsushin, September 14, 1962.)

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FOUR JAPANESE FIRMS TO USE CLASS TWO TUNA MOTHERSHIPS WITH PORTABLE VESSELS:

A large Japanese firm sent the No. 5 Banshu Maru (3,700 tons) mothership, with eight 20-ton fishing vessels on board, to the Indian Ocean east of Madagascar. The vessel was to have left Tokyo on September 22, 1962, as the first mothership licensed as a Class 2 portable-fishing-vessel type operator.

The eight catchers would catch an average of 25 metric tons a day, mainly yellowfin and albacore tuna. A total catch of 2,400

tons is expected to be caught by the end of February 1963. Besides the one firm, three others were said to be planning to send similar mothership expeditions to the same fishing ground on much the same scale as the No. 5 Banshu Maru.

Pelagic tuna vessels, which previous to the change in regulations were considered motherships with portable fishing vessels, are now classified Class 1. There are 24 such motherships with a total of 67 portable fishing vessels. The total gross tonnage of the "motherships" is 28,216 tons. (Suisan Tsushin, Japanese periodical, September 14, 1962.)

The existing tuna motherships with portable vessels classified Class 1 should be smaller than 2,000 gross tons in size. The new Class 2 motherships should be larger than 2,000 gross tons in size and the mothership itself cannot fish in contrast to Class 1 motherships which can fish.

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TUNA MOTHERSHIP OPERATION IN INDIAN OCEAN:

A large Japanese fishing company's Class II portable-vessel-carrying tuna mothership Banshu Maru No. 5 (3,700 gross tons), which departed Tokyo on September 22, 1962, for the fishing grounds in the Indian Ocean, was reported to have started fishing on October 16 in the vicinity of 8°14' S. latitude and 53°33' E. longitude. During the first two days, the eight catcher vessels carried by the mothership landed a total of 25 metric tons of fish, which is somewhat below the planned daily catch of 16 metric tons. Composition of the catch was about as follows: yellowfin 60 percent; big-eyed 25 percent; spearfish 9 percent; other species 6 percent. The albacore tuna catch was extremely light. Other fishing vessels operating in that area also reported poor fishing the latter part of October.

The Banshu Maru No. 5 is the first Class II portable-vessel-carrying tuna mothership to be dispatched to the fishing grounds since the revised tuna mothership regulations were put into effect on September 11. Under the revised regulations, Class II tuna motherships (over 2,000 gross tons) are not permitted to engage directly in fishing and must use portable vessels for the actual fishing. (Suisan Tsushin, October 22, 1962.)

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Japan (Contd.):

YAIZU FISHERY LANDINGS,
JANUARY-AUGUST 1962:

A total of US\$25.6 million worth of fishery products was landed at Yaizu (leading Japanese tuna port) during January-August 1962. The landings this year have been higher in quantity, but lower in value. The total landings in 1961 were worth \$27.8 million. The quantity landed this year through August amounted to 96,214 metric tons, 5 percent more than in the same period of 1961.

Yaizu Fishery Landings, August 1962		
Species	Quantity	Value
	Metric Tons	US\$
Tuna (excl. albacore & skipjack)	4,565	1,000
Albacore	510	1,339
Skipjack	2,650	194
Mackerel	46	568
Others	529	8
Total	8,300	2,215
January-August 1962	96,214	25,654
" " 1961	91,622	23,544

Landings in August 1962 totaled 8,300 tons, worth \$2,215,330. (Suisan Keizai Shim bun, Sept. 19, 1962.)

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FROZEN TUNA HEADS
EXPORTED FOR BAIT:

A Japanese fishery plant in Kesennuma exported 20 metric tons of frozen skipjack tuna heads to Australia. They are to be used as bait in crab and spiny lobster fishing on the coasts of Australia. The offer to buy the heads was made to the Japanese plant last year.

On the Australian coasts, cuttlefish in a basket is now being used for bait to attract spiny lobster and crab. When the shellfish are gathered around that bait, another type of bait is used to hook them. The supply of cuttlefish, however, is not only insufficient but also high-priced, and it was decided to use the heads of skipjack that are now discarded. Good results have been obtained by Australian fishermen using the heads of Alaska pollock from Hokkaido. If the use of skipjack heads proves satisfactory, a large export trade in that product is expected. (Suisan Keizai Shim bun, Japanese periodical, September 19, 1962.)

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FROZEN HALIBUT EXPORT
TRENDS, AUGUST 1962:

Japanese exports of frozen halibut towards the end of August 1962 were reported continuing satisfactorily. Early in August inquiries became more active and the market was firmer, according to the Japanese periodical Suisan Tsushin of August 29, 1962. At the end of August the price c. & f. delivered on the east coast of the United States was 8-10 cents higher than in the same period last year.

By July this year, some 600 short tons of frozen halibut (believed to be mostly steaks) were estimated to have been shipped. The quantity contracted for export was said to be in excess of 1,000 tons. It is felt that this year's exports will exceed last year's 1,150 tons--990 tons to the United States and 160 tons to other countries.

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CANNED JACK MACKEREL SALES,
APRIL-SEPTEMBER 1962:

According to data compiled by the Japan Canned Sardine and Sauri Sales Company, export canned jack mackerel consigned to the Sales Company during the period of April 1 to September 15, 1962, totaled 439,500 cases,



Washing and packing mackerel aboard a Japanese fishing vessel.

Japanese Exports of Canned Jack Mackerel
by Principal Destinations, April 1-September 15, 1962

Country or Area of Destination	No. of Cases
Near and Middle East	13,360
West Africa	31,111
Ceylon	31,554
Indonesia	22,100
Singapore (Malaya)	69,120
Borneo	15,930
New Guinea	17,257

Note: The Japanese year begins on April 1.

Japan (Contd.):

of which 215,000 cases were contracted for sales. Consignments and sales of export canned jack mackerel have shown a decline compared with the corresponding period last year.

Export sales to countries contracting for more than 10,000 cases each during April 1 to September 15, 1962, are shown in table. (Minato Shimbun, October 2, 1962.)

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UNITED STATES-JAPAN AGREE ON SANITATION STANDARDS FOR FRESH OR FROZEN OYSTERS:

The United States and Japan on October 23, 1962, signed an agreement directed toward improving sanitation standards and practices in production and handling of fresh or frozen oysters, clams, and mussels intended for shipment between the two countries. The Agreement provides for establishment of mutually acceptable sanitation standards, exchange of information on the state of compliance with sanitation standards by industries of the respective countries, and a system of certification for fresh or frozen oysters, clams, and mussels shipped from Japan to the United States.

The Agreement is similar to the United States-Canada shellfish sanitation agreement signed in 1948. Practically all oysters, clams, and mussels sold in the United States and Canada are produced under arrangements whereby each is assured that the other is carrying out sanitary surveys of growing areas and preventing harvesting from condemned waters.

Signing the Agreement on behalf of the United States was the Assistant Secretary of State for Far Eastern Affairs, and for Japan was the Ambassador of Japan to the United States. Subsequent implementing arrangements were signed by the Surgeon General of the U. S. Public Health Service and the Counselor of the Embassy of Japan.

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STERN TRAWLER DEPARTS FOR WEST AFRICAN WATERS:

The Japanese stern trawler Akebono Maru No. 53 (1,450 gross tons) departed Shimonoseki, Japan, on September 27, 1962, for the trawl fishing grounds off the western coast

of Africa. The trawler is scheduled to conduct operations for a period of one year and two months.

The vessel, which will be based at Las Palmas, Canary Islands, has a catch target of 3,600 metric tons of sea bream, squid, and other fish. The catches will be transported back to Japan by 1,500-ton freezerships which will be dispatched to the Atlantic fishing grounds from Japan.

A stern trawler, Akebono Maru No. 50 (1,430 gross tons), belonging to the same company that owns the Akebono Maru No. 53, is currently operating in the West African waters. (Nihon Suisan Shimbun, October 3, 1962.)

**Republic of Korea****KOREAN GROUP VISITS ITALY TO IMPLEMENT LOAN TO BUILD FISHING VESSELS:**

At the end of September 1962, a group of Koreans departed for Italy and France to negotiate arrangements for implementation of the contract for a loan of approximately US\$120 million for Korea's fishing industry.

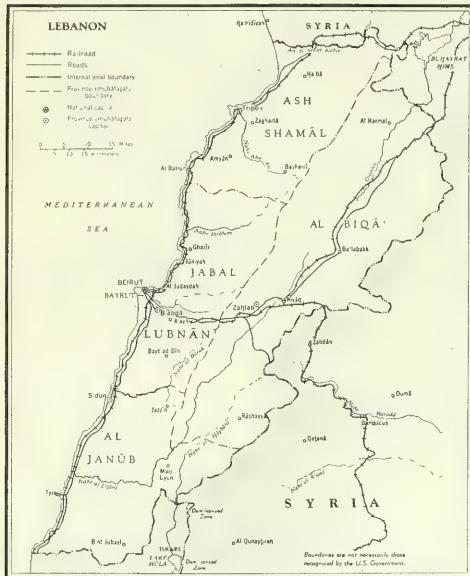
There has been no progress report on the negotiations for implementation of the contract (with an Italian-French combine) which was signed on August 8 and which provided for a substantial increase in Korea's fishing fleet. New fishing vessels with a total tonnage of 118,000 tons are to be built with the loan. (United States Embassy, Seoul, October 5, 1962.)

**Lebanon****FISHERIES TRENDS:**

A survey of Lebanon's fishing industry was completed in August 1962. The survey concludes that Lebanon's meager annual fishery catch could be increased tenfold. There are at present 3,255 fishermen on 970 fishing vessels catching annually only 2,320 tons of fish. Current consumption is low, and over 42 percent of it is met by imports.

A group of Japanese experts last year said that deep-sea and bottom fishing was the answer to Lebanon's small catch. The

Lebanon (Contd.):



lack of a major river emptying into the Mediterranean and the subsequent lack of plankton in coastal waters probably account for the small stocks off Lebanon's coast. The fishery stocks have been further depleted by the widespread practice of dynamiting for fish. In addition to increasing production of this cheap source of protein, the planners are faced with another problem, changing Lebanese consumption habits. (United States Embassy, Beirut, August 17, 1962.)



Malaya

JOINT JAPANESE-MALAYAN CANNERY REPORTED PACKING TUNA IN BRINE:

According to information received by Japanese trading firms, the Malayan Marine Industries, a tuna cannery managed by the Japanese Overseas Fishing Company, appeared to have finally begun packing canned tuna in brine for export to the United States. In December 1961, the Malayan cannery was authorized to annually export 36,000 cases of canned tuna to the United States, but due

to the unprofitable operation of the venture, tuna packing had been suspended.

Considerable attention is focused on the method of sale of the canned tuna packed by the Malayan plant. In particular, interest is focused on the following points: (1) What firm will handle the sales of Malayan canned tuna? (2) Will the export price be the same as that established for Japanese canned tuna exports? (3) How will quality compare with the Japanese product?

If any of the 18 Japanese export agencies that are currently handling exports of Japanese canned tuna undertake the sale of Malayan-packed tuna, the Japanese packers may raise an objection. Any other firm that handles exports of the Malayan production will be closely watched by the Japanese packers as to fairness of export price. (Suisan Tsushin, November 6, 1962.)



Mexico

SHRIMP FISHERY TRENDS, AUGUST-SEPTEMBER 1962:

West Coast Price Dispute Settled: Although Mexican west coast shrimp vessels were fishing toward the latter part of September, boat owners and cooperatives did not agree on final contract terms until September 29. Some vessels had been tied up for more than a week because of a price dispute, but they started fishing on the basis of a tentative agreement reached on September 22. The 1961/62 west coast shrimp fishing season was originally scheduled to start on September 15, 1962.

The contract negotiations were finally concluded on October 1, 1962, and included a concept that is entirely new in Mexico's west coast shrimp fishery. The new contracts between boat owners and cooperatives now provide that the cooperative fishermen are to get 45 percent of the sales value of the shrimp they catch. Ever since the start of Mexico's shrimp fishery as a joint enterprise between boat owners and cooperatives, contracts (like those in effect at Mexico's Gulf ports) were based around a fixed price per ton of shrimp.

Shrimp fishing in Mexico has been reserved for the cooperative fishermen since 1940. Most of the shrimp vessels are privately owned, but are operated by cooperative fishermen on a contract basis approved by the Government. Recent reports were that some of the West Coast vessel owners were considering selling their vessels to the cooperatives.

The new contracts between boat owners and cooperatives on Mexico's west coast are for 3 years and remain in force until August 31, 1965. The principal terms of the contracts are:

1. In delivery of the shrimp, cooperatives are to receive 45 percent of the advance sales price of which only 45 percent of the freezing and packing expenses can be deducted. Shrimp freezing and packing expenses for the entire west coast of Mexico are fixed at 2 pesos a kilogram (7.3 cents a pound). It is customary for consignees to ad-

Mexico (Contd.):

vance the consignors 70 percent of the current shrimp market price at time of shipment. The current market price is determined from Market News Service "Fishery Products Reports" issued by the U. S. Bureau of Commercial Fisheries at San Pedro, Calif. The arrangements are presumed to be only for raw headless shrimp and do not cover processed shrimp such as peeled and deveined.

2. When final sales of shrimp are made, the cooperatives are to receive 45 percent of the difference between the advance price and final price. Also 45 percent of the sales costs will be charged to the cooperatives. Principal sales costs are: (a) brokerage fee, which by these contracts is limited to 7.5 percent; (b) freight; (c) export duty.

3. In addition to paying 45 percent of the freezing, packing and sales costs, the cooperatives are to pay for: (a) crew's food; (b) beverage tax; (c) crew's salary and share; (d) crew's social security.

4. The boat owner is to pay for 55 percent of freezing, packing, and sales costs.

5. In addition, the boat owner is to pay all operating and maintenance costs of the vessels. These include all other costs not shown under "3."

6. The boat owner has the right to pack and sell the product wherever he chooses.

7. Marketable fish caught while fishing for shrimp are to be divided equally between the cooperative and the boat owner.

8. A portion (the amount to be determined by Mexico's Secretariat of Industry and Commerce) of the money the cooperatives receive from the sales of shrimp is to be deposited in the National Bank for Cooperative Development. This fund is to be used for the maintenance and acquisition of cooperative boats and plants.

East Coast Shrimp Contracts: Contract agreements covering Mexico's shrimp fishery at Gulf of Mexico ports were concluded earlier in September. They remain in force for two years until August 31, 1964, and contain the same terms as previous contracts. The Carmen contract calls for an increase to the fishermen of 30 centavos a kilo (about 1.1 U.S. cents a pound) for large headless shrimp. No increase was granted for small shrimp. The breaking point between large and small headless shrimp is between 30 and 31 count to the pound. In addition, the boat owners agreed to an increase of 1 peso (8 cents) per-man-per-day for food (which brings the daily per-man rate to 72 cents), and to pay 300 pesos (\$24 per-boat-per-month for medical services.

Fishing vessel crew shares on shrimp catches in Mexico's east coast fishery are shown in the following table.

Table 1 - Fishing Vessel Crew Shares at Mexican Gulf Ports

Crew Member	Large Shrimp (less than 30/31 count heads-off)	Small Shrimp (over 30/31 count heads-off)
	..... (U.S. ¢/lb.)	
Captain . . .	3.34	1.31
Engineer . . .	2.62	1.13
Winchman . . .	1.74	.87
Cook . . .	1.74	.80

In addition, it is customary for boat owners to pay bonuses to the crew. These may at times be more than double those shown in the cents per pound crew shares for selected crew members. The Campeche shrimp contracts are only slightly different from those covering Ciudad del Carmen.

Shrimp Export Duties Increased: Mexico's shrimp export duties were increased about 38 percent during the latter part of August 1962 (published in *Diario Oficial*, August 27, 1962). Frozen shrimp exported from east coast points, and from Salina Cruz, Oaxaca, and Santa Rosalia, Baja California, now has a Federal export tax of about 3.5 cents a pound. The export duty on frozen shrimp from the rest of Mexico's west coast is about 3.7 cents a pound. In the State of Campeche, there is an additional local tax of about 2.2 cents a pound on shrimp exports.

Cooperative Buys Shrimp Freezing Plant: The first shrimp freezing plant in Mexico to be owned by cooperative fisherman was purchased by the Regional Federation of Cooperative Societies "Southern Sonora" during August. The plant, which is located in Guaymas and was formerly the "Mariscos Congelados del Pacifico," was bought with funds from a loan of about \$136,000 from Mexico's National Bank for Cooperative Development.

Fishing Port being Developed with Dutch Funds: A fishing port at Alvarado, Veracruz, is to be developed with funds from a loan of about \$6 million granted by Dutch interests in Amsterdam to the National Bank for Cooperative Development. The total cost of developing the fishing port is estimated at a little more than \$6 million, with completion date for the project set at two years. The project will include port and harbor works, 5 multipurpose fishing vessels, freezing, canning, smoking and drying facilities, and also ice-making and fish-meal plants. (United States Embassy, Mexico City, dispatch dated October 5, 1962.)



Morocco

TERRITORIAL WATERS EXTENDED:

Morocco has declared a 12-mile limit on her territorial waters in the Mediterranean Sea and the Atlantic Ocean, and a 6-mile limit on the waters off the coast of southern Morocco, according to information received by the Japanese Fisheries Agency.

Reportedly, this measure was taken to protect Morocco's domestic fishing industry. The 12-mile limit will affect Japanese trawl fishing in West African waters, particularly off the north-western coast of Africa, where 12 to 13 large Japanese trawlers are regularly trawl fishing. (*Suisan Keizai Shimbun*, October 16, 1962.)

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FROZEN SARDINE EXPORTS TO FRANCE TO BE RESUMED:

Moroccan frozen sardine exports to France were expected to be resumed in October 1962. It was anticipated that the supply from French sources would be insufficient to meet the demand. Exports of frozen sardines to France were suspended in July 1962.

A total of 2,000 metric tons of frozen tuna were to be exported to France also.

Morocco (Contd.):

The Moroccan fishing and freezing industries are heavily dependent upon exports of frozen fish to France. The loss of that market has been a hard blow to them. (Based on a newspaper article as reported by the United States Embassy, Rabat, October 8, 1962.)



Mozambique

SEEKS JOINT FISHING VENTURE WITH JAPAN:

The Japan Export Trade Promotion Association and the Japan Fisheries Society reportedly have received an inquiry from fishing interests in Mozambique, Africa (Portuguese possession) which are said to be seeking a joint Japanese-Portuguese fishing venture in Beira, Mozambique. Mozambique does not have a large fishery, although her extensive eastern coast abounds in high quality fish, especially shrimp. Bottomfish fishing is prohibited in Mozambique, but the territorial government is said to have recently approved seining and trawling.

In Beira, three small fishing vessels were engaged in fishing as of November 1962, but fishing on such a small scale cannot possibly meet market demands. Therefore, by linking up with the Japanese, the fishing interests in Beira hope to introduce Japanese investments and fishing techniques to increase Mozambique's fish production. A large potential consumer market for fish exists in Rhodesia where good transportation facilities are available. The Mozambique Government is also reported to have approved the establishment of a joint venture with Japanese investments. (Suisan Tsushin, November 7, 1962.)



Nigeria

POLAND SENDS FACTORY TRAWLER TO NIGERIA:

The Neptun, a Polish vessel of the 280-foot Dalmor-class factory stern trawler, in August 1962 departed on a 10-months' trip to West African waters to fish for a joint Nigerian-Polish company at Lagos. The firm will service the vessel and additional Polish trawlers which will be delivering

catches to Nigeria. (Polish Press Digest, September 2, 1962.)



Norway

TUNA LANDINGS AS OF SEPTEMBER 9, 1962:

Tuna landings by Norwegian fishermen amounted to 6,352 metric tons as of September 9, 1962--about 650 tons more than for the same period in 1961. Earlier reports this season indicated that the catch would be less than in 1961, but it now appears that it may be as good or better. Norway's total 1961 tuna landings were 6,582 tons with an export value of about \$2 million. The tuna fishing season in Norway is from July to October, with the main fishery for this species off West Norway.

Three tuna (weighing from 450 to 550 pounds) bearing United States tags were caught off Norway's coast since August 1962. (News of Norway, September 27, 1962.)

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HERRING FISHERY TRENDS, SEPTEMBER 1962:

Summer Herring Catch: The Norwegian summer herring fishery off the coast of Iceland yielded a record catch of 139,500 metric tons in 1962. Fishermen were aided by unusually good weather in the summer of 1962. The good summer herring catch has considerably improved the prospects for Norwegian exports of industrial fish products.

Icelandic summer herring have provided Norwegian fishermen with an off-season fishery for many years. The fishery has become more important in recent years because of the declining Norwegian winter herring catch. The Icelandic summer herring is actually the same as the Norwegian winter herring. In the summer, the herring move from the coast of Norway to waters off Northern Iceland.

The decline of the Norwegian winter herring fishery left the West Coast meal and oil industry heavily overexpanded. The industry has been dependent on Government subsidy for a long time. It sought Government financing to ease the closing of some of the marginal producers. But the Department of Industry of Norway was reported to be re-

Norway (Contd.):

sisting the plan. (United States Embassy, Oslo, October 1, 1962.)

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FISHERY SALES ORGANIZATION'S SALES AND EXPORTS SET RECORDS:

The joint sales organization of some 90 Norwegian fish freezing plants (Norsk Frosenfisk A/S) reported in October 1962 record sales and exports of its brand frozen fish products. In the operating year that ended June 30, 1962, sales rose 10,100 tons to total 37,000 metric tons. Total sales were valued at Kr. 128 million (US\$17.9 million), an increase of over Kr. 30.4 million (\$4.2 million), or 32.6 percent as compared with the 1960/61 fiscal year.

Nearly 34,000 tons went to export markets. This was 9,000 tons more than in 1960/61. The value of the exports rose 38 percent. Sales to the United States increased 50 percent, from about 4,000 tons to over 6,000 tons.

Despite these encouraging developments, the organization's annual report sounds a somber note about what will be in store if Norway does not join the European Economic Community. In that event, it says, the EEC import duty on frozen fish would give the Common Market frozen fish industry an 18 percent price advantage. In the long run, this would tend to reduce Norwegian exports to EEC. (News of Norway, October 25, 1962.)

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NEARLY ALL EX-WHALERS HAVE SHORE JOBS:

Early November 1962 reports from Vestfold, the heart of Norway's whaling industry, state that nearly all of the whalers idled by the reduction of the Antarctic whaling fleet from 7 to 4 expeditions had found jobs in industry, shipping, and agriculture. Only those over 60 have any real job problems. Business, however, is feeling the effect of the cutback as whaling companies spend much less locally.

In the 1961 season, about 130 residents of Larvik were employed as whalers. But, though none went to the Antarctic this fall, only two ex-whalers were unemployed. What the situation will be when the winter slack sets in remains to be seen.

A year earlier about 1,100 whalers came from Sandefjord and Sandar. In 1962, the number dropped to 600. Yet, only some 15-20 of the 500 whalers who had to stay on shore were registered as unemployed as of October 1. All the others have jobs.

A similar development is reported from Tonsberg, Notteroy, and Sem. In those three districts, some 700 whalers were recruited last season, and only half as many in the fall of 1962. Nevertheless, very few of the ex-whalers are idle. And these are all in the 60 and over age bracket. (Norwegian News of Norway, November 8, 1962.)

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NEW NORWEGIAN STERN TRAWLER "HEKKTIND":

The annual marketable catch of the first Norwegian stern trawler Hekktind is expected to be about 1,800 metric tons of fresh iced gutted and headed cod. Built recently by a firm in Bergen, Norway, the Hekktind is a 151-foot welded vessel, 630 gross tons, equipped with a controllable pitch propeller, and a 1,300 b. hp. Diesel engine giving a speed of about 12 knots. There are two through steel decks.

The Hekktind is the product of extensive research in fishing vessel design and a detailed analysis of the fishing conditions under which it would operate. It has met expectations. The value of the Hekktind's catch in the first six months of 1962 was 885,000 kroner (US\$123,952), while operating costs including wages and bonuses to the crew amounted to 767,700 kroner (US\$107,524). The Hekktind lost only 8 hours fishing time in 1961 due to bad weather. It has hauled as much as 40 metric tons of fish through the stern chute without difficulty. The Hekktind's net has been hauled, emptied on deck, and reset on the bottom with 300 fathoms of cable out in only 15½ minutes. Hydraulic winches haul the net at an average rate of one fathom per second. Net handling and emptying time on deck amounts to less than 5 minutes. The trawl is handled on the upper deck while the fish are dressed on the lower deck. The fish hold is located midships for two reasons--shortest transportation from working space to hold and the practically nonexistent influence of the hold cargo on fore and aft trim of the vessel.

A catch of 159 metric tons can be unloaded from the Hekktind in 3 hours with

Norway (Contd.):

the use of forklifts because fish are stored in boxes on pallets. Fish are stored in welded aluminum boxes between layers of flake ice. The boxed fish are placed on pallets in the chilled hold where the temperature is kept at 0° to -2° C. (32° to 28.4° F.) by air circulating past cooling batteries. In order to have proper and evenly distributed chilling, the boxes are kept apart by pressed warts in the sides of the boxes. Fresh cod stored in this manner keep almost twice as long as fresh cod stored in the white painted wooden boxes on traditional vessels. Even ten-day-old cod from the Hekktind has passed as prime quality, whereas Norwegian fish inspectors do not usually accept fresh cod more than 4-6 days old as prime cod for filleting or freezing. The aluminum boxes can be kept clean and the boxes are stored on pallets in such a manner that drainage from a box does not contaminate the boxes underneath. The use of the pallet system reduces fish handling.

Since the Hekktind was designed mainly to land fresh fish for the filleting and freezing plants on the north coast of Norway, it does not have freezing equipment. It does have a chilling installation in the hold. The only processing equipment on board the vessel is a cod-liver oil plant which has not been found profitable.

The designers of the Hekktind have stated that they are willing to sell their designs for construction abroad. The vessel was built mainly for use in the Norwegian trawl fishery for cod, but the designers also had in mind using the vessel as a midwater trawler or a purse-seiner. Before the Hekktind was built, the designers made a study of sea and weather conditions throughout the year on the banks of the north coast of Norway, in the White Sea, and on the Bear Island and Spitsbergen grounds. They also tried to assess the possible total out-of-port time and the division of out-of-port time into actual fishing time (with the gear on the bottom), net handling time, and transport time. The assessment made them decide to build the vessel as a seagoing tug. The shelter deck design which was used makes it easier to store and preserve fish and adds to the safety and comfort of the crew.

Different trawls were studied and an analysis made of various methods of shooting

and hauling the gear. The emphasis was on finding the gear handling method which required the least time and a minimum effort on the part of the crew. The analysis guided the layout, length, and equipment of the trawl deck.

The lines and propulsion arrangement were developed by the Ship Model Test Basin attached to the Norwegian Technical University in Trondheim, Norway. The one hull form was agreed upon and tested according to normal test procedure. The hull form was also model-tested in waves of varying length, both from astern and ahead. The waves height-length ratio was held at 1:38. The tests showed that the model's movements (setting and pitching) were heaviest at wavelengths corresponding length between perpendiculars x 1.25. Also the center of gyration, as intended, was clearly aft of midships. Thus the movements on the aftship should be reasonable and the water level at the ramp generally constant.

The captain of the vessel maintains that it will be able to fish under worse conditions than the British Fairtry-type vessels. The designers took into account the icing capacity of the vessel in studying the stability problem. The Hekktind's rightening arm (G. Z.) is at the maximum between 45-55° and tends to disappear at 80-90° under all conditions. The initial stability (G. M.) light vessel is 8 $\frac{1}{2}$ inches and the total load of ice evenly distributed with half cargo and generally half empty tanks throughout is about 130 tons.

The designers of the Hekktind have built another stern trawler which is named the Vaagtind. The Vaagtind is similar to the Hekktind although the new vessel is described as having improvements to the bridge arrangements and handling facilities on the trawl deck.

The cost of constructing the Hekktind is not known but shipyard construction costs for fishing vessels in Norway average about as follows: labor and overhead costs 35 percent; steel and aluminum 20 percent; other materials and services (engines, pumps, subcontractor items, etc.) 45 percent. The cost of fishing gear for the Hekktind amounted to 160,000 kroner (US\$22,410).

The operating costs of the Hekktind during the first six months of 1962 were broken down as follows:

Norway (Contd.):

	Kroner	US\$
Compensation to 25-man fishing crew:		
Wages	63,000	8,824
Bonuses	305,500	42,788
Total compensation ^{1/}	368,500	51,612
Management and administrative costs:		
Insurance on vessel and catch	56,000	7,843
Management and administration	14,800	2,073
Incidentals	3,000	420
Travel	13,400	1,877
Dues to fisheries association	23,700	3,319
Total management and administrative costs	110,900	15,532
Fuel and supplies:		
Provisions	14,600	2,045
Fuel and lubrication oil	125,300	17,550
Maintenance	53,300	7,465
Stores, deck machinery, etc.	9,100	1,275
Maintenance of gear	86,000	12,045
Total fuel and supplies	288,300	40,380
Total costs	767,700	107,524

^{1/}Crew compensation averages about 35 percent of the value of the catch.

The Hekktind's logbook shows that out-of-port time in 1961 was broken down as follows: transport to and from the fishing grounds--33.2 percent; trawling with gear on the bottom--53 percent; gear handling--9.8 percent; and miscellaneous interruptions--4 percent. The owners hope to keep the Hekktind at sea for 320 days a year. The plan is based on full use of the pallet system for unloading and taking on ice and allows for twice yearly dry-docking.

About 75 percent of the actual catch of the vessel as landed on deck consists of marketable cod. The remainder (flatfish, a few ocean perch or redfish, and some undersized cod) is discarded. Heading and gutting the cod results in a loss in weight of 8 to 10 percent for viscera and 16 to 20 percent for heads. In early October, the Norwegian ex-vessel price for prime headed and gutted cod was 0.9 to 1.0 kroner per kilogram (6.4 U.S. cents a pound). About 90 percent of the Hekktind's catch of marketable cod meets the test for prime fresh cod and is sold for filleting and freezing. The balance of the cod is sold for drying at a somewhat lower price.

Up to 85 percent of the cost of constructing Norwegian fishing vessels may be provided by low-interest Government loans. The Fisheries Bank may finance 60 percent of construction costs with a long-term loan bearing 2-3 percent annual interest. The North Norway Development Fund may finance an additional 20 to 25 percent of the costs with a loan at 4 percent interest repayable usually in 12 years. In some cases the first repayment on loans is not due for 4 or 5 years. Norwegian trawlers are also aided by the current subsidy on cod landings which amounts to 0.05 kroner per kilogram (32

U. S. cents per 100 pounds). (European Regional Fisheries Attaché, United States Embassy, Copenhagen, September 26 and October 3, 1962.)

Note: One Norwegian kroner equals US\$0.14.



Peru

EXPORTS OF PRINCIPAL MARINE PRODUCTS, JANUARY-JUNE 1962:

Item	Quantity	Value ^{1/}	
		Metric Tons	Million Soles
Fish meal	588,481	1,473.6	54,965
Fish oil	61,238	155.7	5,808
Fish (froz., canned, etc.)	16,644	117.1	4,368
Fertilizer (guano)	4,427	11.9	444
Sperm oil	2,463	8.6	321
Whale meal	1,564	2.5	93

^{1/}F.o.b. values converted at rate of 26.81 soles equal US\$1.
(United States Embassy, Lima, October 3, 1962.)

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FISH MEAL MARKETING ORGANIZATION GAINS LEGAL CONTROL OVER PERUVIAN FISH MEAL EXPORTS:

A Peruvian Decree-Law No. 14228 has the effect of giving the Consorcio Pesquero del Peru S. A. (Peruvian marketing organization for fish meal producers) complete control over all Peruvian fish meal exports. The Decree was published November 5, 1962, in El Peruano by the Peruvian Government. The Decree applies to the export of raw materials (materias primas). (Editor's note: fish meal is classified as a raw material by the Peruvian Government.) The Decree establishes the requirement that where two-thirds of the producers of a raw material, accounting for two-thirds of the national production, are formed into an export cooperative, all other producers must sell through the cooperative. (United States Embassy, Lima, November 8, 1962.)

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GOVERNMENT'S NEW PROCEDURES FOR FISH MEAL PLANT LICENSES:

New requirements for issuance of licenses to fish meal plants in Peru are included in a law published in El Peruano, August 29, 1962. When published, the law was erroneously designated as Decree-Law No. 14195. The correct title is Supreme Decree No. 11.

Regulations covering procedures under Supreme Decree No. 11 are contained in

Peru (Contd.):

Ministerial Resolution No. 4965, dated September 27, 1962, which was published in El Peruano, October 31, 1962. (United States Embassy, Lima, November 5, 1962.)



Ryukyu Islands

TUNA FISHING TRENDS:

Japanese tuna vessels have always been in demand by tuna fishermen of Okinawa. In the fall of 1962, a 196-ton vessel registered at Ishiomaki, Japan, was sold to a Naha, Okinawa, firm.

At Naha, there are some 20 skipjack tuna vessels of more than 100 tons each operating. Naha is used as their base. Also, about 100 Japanese fishing vessels from 80-350 tons each are engaged in tuna long-line, skipjack hook-and-line, and mackerel fishing in southern (Pacific) fishing grounds and in inshore waters.

In tuna fishing, a 200-ton-class vessel can catch US\$18,000 worth of fish per fishing trip lasting about two months. This nets each crew member \$150-\$300. One-third of the catch is consumed on Okinawa and two-thirds is exported to the United States. While albacore and yellowfin tuna are high-priced, bluefin tuna are sold at fairly low prices in Okinawa. Fishing firms in Okinawa are either chartering vessels from Japan or buying them, since equipment and techniques of local shipbuilding are not up to the recognized standards. (Suisan Keizai Shimbun, October 5, 1962.)



South Africa Republic

NEW DIRECT SHIPPING POINT FOR FISH MEAL:

Salданha Bay, north of Cape Town, may become a new direct shipping point for fish meal produced in South Africa. Formerly, ocean cargo from the Bay area was shipped by rail or coastal vessel to Cape Town. It is hoped that the recent initial shipment of 590 tons of bagged fish meal will prove the feasibility of loading ocean freighters at

Salданha. (South African Shipping News and Fishing Industry Review, July 1962.)

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PARTICIPATION IN INDIAN OCEAN RESEARCH:

The South African research vessel Africana II this summer completed a 30-day cruise of about 4,200 miles to the southern Indian Ocean as part of that country's contribution to the International Indian Ocean Project being conducted by 12 countries. South Africa is the only continental African country taking part in that study. (Various sources.)



Spain

BILBAO TUNA FISHERIES TRENDS, THIRD QUARTER 1962:

Landings of "bonito" (the local name for albacore tuna) in the Bilbao area of Spain from Cantabrian waters during the 1962 season were about the same as in 1961. The demand for canned tuna in the domestic and foreign markets was good. Average ex-vehicle prices this year were reported as 30-31 pesetas a kilogram (US\$500-517 a metric ton) for round or whole albacore tuna as compared with 23-24 pesetas a kilogram (\$384-400 a metric ton) in 1961. Retail prices for fresh albacore in 1962 averaged 60 pesetas a kilogram (45 U. S. cents a pound) as compared with 45 pesetas a kilogram (34 cents a pound) in 1961.

During October 1962, negotiations were under way between local fishing vessels and the United States canning firm, which handled their catches during the winter fishing season off the west coast of central Africa. The United States firm has expanded its freezing facilities on Africa's west coast. There seemed to be some interest in the vessels making trips to West Africa, but part of the local fishing fleet was going to change its plans of operation, and for the first time will get support from Spanish vessel owners.

A Bilbao fishing vessel owner remodeled the former coast cargo vessel Barazar by installing a freezing unit on the vessel. The Barazar, which has a maximum cargo-carrying capacity of 930 metric tons, was built in Bilbao in 1957, and will accompany the fleet

Spain (Contd.):

to the African fishing grounds. Ten fishing vessels will transfer their tuna catches to the Barazar to be frozen, and will in turn be supplied with ice, provisions, and any medical assistance that is needed. The remodeled vessel was expected to be operating in the very near future.

For the 1963/64 tuna fishing season, the same firm also plans to operate a sister ship to the Barazar, which is now being built in a local shipyard. In addition, the company will send another vessel, the Aralar with a capacity of 800 metric tons, to operate as a refrigerator vessel. The Aralar is now being built with Government financing at an estimated cost of 40 million pesetas (about US\$667,000). The Aralar will bring frozen fish to Spain from the Barazar, and will in turn supply the freezer vessel with provisions, medical supplies, and mail from Spain. (United States Consulate, Bilbao, October 11, 1962.)

**Tunisia****TERRITORIAL WATERS EXTENDED:**

Formal notice of Tunisia's claim to extended territorial waters was given by the publication of Law No. 62-35, October 16, 1962, in the Tunisian Official Journal of the same date. Subsequently, the Chief of the American Section in the Foreign Affairs Secretariat reported that Tunisia's claims were as published, with particular reference to the extension of her territorial waters to the fifty-meter isobath line from south of Ras Kapoudia to the Libyan frontier. (United States Embassy, Tunis, November 2, 1962.)

**U.S.S.R.****FISHERY EXPLORATION IN BERING SEA:**

Two Soviet medium trawlers this summer were exploring for fish in the central Bering Sea. Some drags were made at depths of 700 meters (2,300 feet) and attempts were to be made to fish down to a depth of 1,000 meters (3,280 feet). One haul yielded about 1,750 pounds of sablefish and ocean perch. (Unpublished sources.)

**FISHING FLEET EXPANSION AND 1961 CATCHES:**

In the next ten years, the Soviet Union expects to add about 1,000 large and medium fishing vessels to the fleet.

In 1961, catches by medium trawlers (SRT's) varied widely. SRT's operating out of Murmansk each took 600 metric tons during the year; Leningrad craft caught 500 tons per vessel; and the Far East fleet averaged 1,200 tons per trawler. Fishing time per vessel ranged from 23 percent to 46 percent of total time away from port. (Unpublished sources.)

* * * * *

STERN TRAWLER RETURNS FROM WEST AFRICA:

The Tropik, new Soviet stern trawler built especially for operations in tropical waters, completed its maiden voyage to West African waters this summer. The vessel and its equipment reportedly did not meet expectations. (Unpublished sources.)

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TWO-BOAT TRAWL USED IN NORTH ATLANTIC:

Two Soviet medium trawlers this summer were fishing a two-boat trawl in the North Atlantic. Catches ranged up to 40 metric tons of herring per haul. (Unpublished sources.)

**United Kingdom****FISHERY STUDIES BY HUMBER LABORATORY:**

Expansions carried out at the Humber Laboratory, Hull, England, over the past nine years were to enable closer liaison with and to solve special problems of the English fishing industry. The current program of work of the laboratory can be summarized as follows:

1. The development of a trawler with a vertical plate freezer for catch-freezing at sea.
2. Pilot plant for the dielectric thawing of frozen fish blocks, using a current of 5,000 volts at a frequency of 36 megacycles per second. (Fish blocks are thawed from an

United Kingdom (Contd.):

original temperature of -20° F. to $+30^{\circ}$ F. in a period of 15 minutes.)

3. An improved sampling technique for testing fish freshness on arrival at port by measuring the quantity of trimethylamine present in fish.

4. An apparatus for measuring the toughness of fish meat. A small sample of fish is broken up in water mechanically, and the resultant opacity of the mixture is measured in

a colorimeter which provides a direct indication of toughness.

5. A survey to establish the edible value of fish exposed to temperatures ranging from 30° to 80° F.

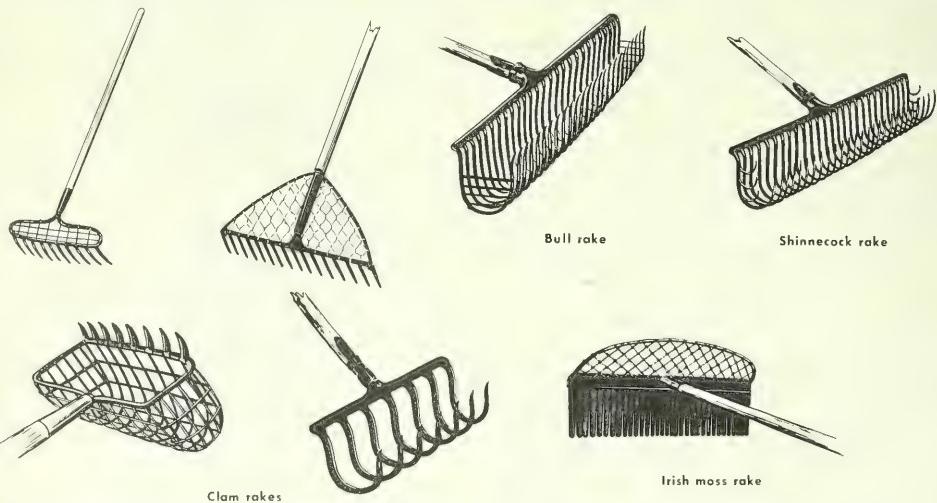
6. The development of a resistance spear thermometer that provides an instantaneous temperature reading of fish in transit and which can also be utilized in cold storage plants and laboratories; the instrument has an accuracy of $\pm 0.2^{\circ}$ F. (*Bulletin de l' Institut International du Froid*, Vol. XLII, no. 4, 1962.)



RAKES

There are two different types of rakes used in the commercial fisheries. They are the common clam rake and the bull rake. The common rake for clams is much like a garden rake except that the teeth are longer and sharper. It is equipped with a wire mesh basket or apron which holds the catch. It is generally used in very shallow water. There are many modifications which are used in different areas. One of the modifications, in Maine, is used for gathering Irish moss. The bull rake is a large implement with a head between twenty and thirty inches wide. It has long curved teeth about nine inches long and unlike the common hand rake it does not have a basket or apron. Its handle is usually longer and is fished in deeper water than the hand rake. The bull rake is used generally in New England.

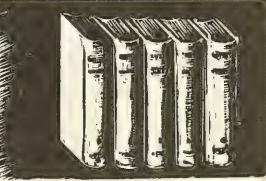
The Shinnecock rake is a modified New England bull rake used only in Maryland. The long curved teeth are progressively smaller towards the ends of the rake head. This forms a basket on which the clams rest as they are raised from the bottom.



Note: Excerpt from Circular 109, *Commercial Fishing Gear of the United States*, for sale from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., single copy, 40 cents.



FEDERAL ACTIONS



Department of Commerce

AREA REDEVELOPMENT ADMINISTRATION

INDUSTRIAL LOAN TO FISHERY FIRM IN WASHINGTON STATE APPROVED:

A \$455,000 industrial loan to help Farwest Fisheries, Inc., to establish a tuna canning plant at Anacortes, Wash., has been approved by the Area Redevelopment Administration (ARA) of the U. S. Department of Commerce.

Sixty new jobs will be created in the new tuna canning plant. Farwest Fisheries, Inc., of Anacortes will establish the tuna cannery by purchasing an existing salmon cannery, expanding coldstorage and dock space, and buying new machinery and equipment to process and can tuna.

Canning tuna.

Installation of the tuna canning facilities will permit year-round operation of the cannery. It will help stabilize employment in Anacortes, which is affected by such seasonal industries as tourism, salmon fishing, and fruit and vegetable packing.

The ARA loan, repayable over a 20-year period and bearing an annual interest rate of 4 percent, will finance only part of the cost of the new tuna cannery. A fishery products brokerage company in the State of Washington will purchase a \$100,000 participation in the ARA mortgage. The total cost of the Anacortes project will be \$700,000. In addition to the Federal funds, a bank in Anacortes will invest \$140,000; a local nonprofit organization known as Skagit County Development Association will contribute \$70,000; and Farwest Fisheries, Inc., is putting \$35,000 of its own funds into the project.

Anacortes is in Skagit County, Wash., which was designated as eligible to participate in the Area Redevelopment program because of persistent and substantial unemployment and underemployment over an extended period of time.

The Small Business Administration investigated the Anacortes project and made recommendations which led to approval of the loan by ARA. The U. S. Bureau of Commercial Fisheries also played a key role in the investigations which preceded ARA approval of the project.



Department of Health, Education and Welfare

FOOD AND DRUG ADMINISTRATION

SURVEY OF STATE AND LOCAL FOOD AND DRUG LAWS:

A survey of state and local food and drug laws and the facilities for their enforcement will get under way this year, according to an October 15, 1962, announcement by the Commissioner of the U. S. Food and Drug Administration.

The survey, long sought by state and Federal food and drug officials, is made possible by \$300,000 which Congress included in this year's appropriation for the Federal agency. Representatives of the Association of Food and Drug Officials of the United States and the Food and Drug Administration held a planning session October 5.

The objective of the survey is to determine what improvements are needed in laws, resources, and facilities of agencies concerned with protecting consumers of foods, drugs, devices, cosmetics, and household chemical products. The study will be made by a nonprofit research organization outside the Government.

PUBLIC HEALTH SERVICE

**SHELLFISH SANITATION CENTERS
TO BE IN OPERATION IN 1963:**

The new shellfish sanitation research centers at Kingston, R. I., and Dauphin Island, Ala., of the U. S. Public Health Service are expected to be in operation by July 1963. Both centers will engage in research designed to assess pollution dangers in shellfish growing areas and develop new ways to safeguard the sanitary quality of market oysters, clams, and mussels.

Scientific staffs in both centers will engage in microbiological, radiological, and toxicological studies as well as give technical assistance and training to state personnel engaged in shellfish sanitation activities. An estimated 65 scientists, technologists, and supporting staff will be employed in the Kingston facility to provide research and training assistance to New England shellfish-growing states. An estimated staff of 35 will be employed at Dauphin Island to provide such support to South Atlantic and Gulf Coast shellfish-growing states.

Recruitment of bacteriologists, chemists, laboratory technicians, marine biologists, oceanographers, sanitary engineers and others is currently under way by the Service's Division of Environmental Engineering and Food Protection, Washington 25, D. C.

**Department of the Interior****UNITED STATES STRIVES TO
REHABILITATE ITS FISHING INDUSTRY:**

The most intensive oceanographic research program in the history of the United States, part of an Administration drive to rehabilitate the Nation's fishing industry, was cited in October 1962 by Secretary of the Interior Stewart L. Udall as "a vital part of an unequalled conservation record attained to date through Departmental actions and those of the 87th Congress." His remarks accompanied the submission of a 32-page report outlining what he termed "an all-time high-water mark in conservation and resource management."

The report's section on oceanography cites the "long-overdue recognition" provided marine research, involving the building of three new ocean-going laboratories, the conversion of two Navy tugs for the same purpose, and the commissioning in early 1963 of the all-season, all-weather fishery research *Albatross IV*. During coming months, work also will start on new fisheries research laboratories at La Jolla, Calif., Ann Arbor, Mich., Beaufort, N. C., and Seattle, Wash.

Additional recognition of the growing need for knowledge, particularly among young students, of our fishery resources,

was provided by Congress in authorizing expenditure of \$10 million to provide the Nation's Capital with an outstanding fishery research center and aquarium.

"Fishing as a United States industry has in many areas lagged competitively behind other nations that are making great technological strides," Secretary Udall said. To restore the prosperity of the United States fishing industry and to guarantee consumers ample supplies of protein-rich fishery products, accelerated programs are under way involving laboratory research, ocean surveys, construction of hatcheries, fish-survival facilities at dams, and provisions for industry loans.

"Additionally, through research conducted by U. S. Bureau of Commercial Fisheries scientists, the United States has now taken a lead in an intensified program to develop a marketable fish protein concentrate which not only can provide an important economic stimulus to the domestic fishing industry, but can provide a dramatic new answer to the world's hunger problems."

Secretary Udall estimated there are approximately from 7 to 9 million tons of fish not presently harvested in United States waters that can be utilized to produce fish protein concentrate (FPC). "Processing FPC will allow our fishing fleets to become year-round operations, rather than seasonal," he said.

Other high points in the conservation accomplishments reported included:

1. A vigorous new Water Pollution Control Act is mounting a full-scale attack on one of our most destructive forms of waste;

2. National investment in water conservation and development projects has reached an all-time high, including two major reclamation projects.

3. A new marine laboratory has been established at Sandy Hook, N. J., to study management of salt-water sport fish--the basis of a growing industry, and a national reservoir fishery research program has been launched with establishment of two new research centers in South Dakota and Arkansas.

4. At President Kennedy's request, a special Interagency Committee on Oceanography has been established to coordinate an expanded long-range program of oceanographic research designed to meet the divergent needs of commerce, defense, atomic energy development, and production of mineral and fishery resources.

5. Educational grants have been provided oceanographers and other marine scientists; vast areas of the ocean are being surveyed; new programs, both construction and research, are under way to assist salmon migration over dams; more than a million dollars in ARA loans has provided economic stimulus and a fishing vessel construction subsidy program is under way in New England.

6. Valuable new progress has been made in studies of diseases and pesticides as a result of the establishment of the new Federal Pest Control Review Board.

FISH AND WILDLIFE SERVICE

BUREAU OF COMMERCIAL FISHERIES

**NEW ASSISTANT REGIONAL DIRECTOR
APPOINTED FOR GREAT LAKES
AND CENTRAL REGION:**

Ernest D. Premetz, Assistant Chief of the Branch of Marketing, U. S. Bureau of Commercial Fisheries, Washington, D. C., has

been appointed Assistant Regional Director of the Bureau's Great Lakes and Central Region, with headquarters at Ann Arbor, Mich., the Department of the Interior announced on October 18, 1962. The appointment was effective October 28.

The Great Lakes and Central Region includes Arkansas, Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, Oklahoma, South Dakota, Tennessee, Wisconsin, and those portions of New York and Pennsylvania bordering the Great Lakes.

Premetz entered Federal service as an aquatic biologist in 1949. As Fishery Research Biologist, he was associated with the flounder and haddock investigations at New Bedford and Woods Hole, Massachusetts, until 1954, when he was assigned to Washington, D. C., to participate in the Departmental Management Training Program. He joined the Branch of Marketing in August 1955 and headed up the industrial utilization program in the Great Lakes area with headquarters at Sheffield Lake, Ohio. Later, he was detailed to Washington, D. C., for 3 months as a member of a 4-man task force to help develop a long-range program for the Bureau of Commercial Fisheries; and in May 1958, he was transferred to Washington, D. C., as Assistant Chief, Branch of Marketing.

SPORT FISHERIES AND WILDLIFE

TWO FISHERY RESEARCH STATIONS DEDICATED:

Two Fish and Wildlife Service fishery research stations, one in Wisconsin for fish population control studies and one in Arkansas to work on fish-farming experiments, were dedicated during the week of October 21, 1962, the U.S. Department of the Interior announced.

The Fish-Farming Experimental Station was dedicated October 21, at Stuttgart, Ark. The work at that station is designed to find ways of growing fish profitably in conjunction with rice and other agricultural crops. This station has a modern laboratory, fish-holding facilities, shop, garage, and storage buildings, plus several reservoirs and holding ponds.

Some of the problems to be solved are: water quality and levels; control of aquatic vegetation; overpopulation; predation; disease and parasite infestations; feeding; and brood stock selection.

The station is under the administration of the Fish and Wildlife Service's Bureau of Sport Fisheries and Wildlife. The Service's Bureau of Commercial Fisheries is cooperating in improving processing, merchandising, and distributing methods for fishery products produced through fish-farming techniques.

The Fish-Control Laboratory in La Crosse, Wis., was dedicated on October 25 in conjunction with the Tri-State Fishery Conference.

The Fish-Control Laboratory at La Crosse was established to develop the necessary tools for controlling unwanted fish populations. Although the search for better chemical toxicants will be the initial objective of the station, other methods of control will also be studied.

Chemical removal of fish populations is not new. The technique was largely developed in the North-Central States and has been widely used for decades. These toxicants will not harm other forms of wildlife living in or near the water or human beings who might drink the water. Future emphasis, however, will be on the search for toxicants that will be even more selective, controlling certain unwanted fish without harming the more desirable kinds.

To carry out this intensive research program, a staff of chemists, biologists, and other specialists has been assembled at the La Crosse station. Considerable remodeling of buildings has been completed to provide adequate research facilities.

These two research stations of the U.S. Fish and Wildlife Service are expected to make a major contribution toward improved fresh-water sport and commercial fishing.



Department of Labor

WAGE AND HOUR AND PUBLIC CONTRACTS DIVISIONS

EXPIRATION DATE EXTENDED ON HANDICAPPED WORKER CERTIFICATES ISSUED TO SHELLFISH INDUSTRY:

The expiration date of handicapped worker certificates issued to workers in the shellfish industry has been extended to January 31, 1963. The extension was made by the U. S. Department of Labor under Section 524.12 of 29 CFR Part 524 pending completion of analysis of a survey of the shellfish industry conducted by the Bureau of Labor Statistics of the U. S. Department of Labor. The survey by that Bureau may affect future Department of Labor rulings concerning the shellfish industry. In the case of new applications for handicapped worker certificates submitted before January 31, 1963, present standards and procedures will continue to be used in the issuance of certificates.

* * * * *

CONDITIONS GOVERNING EMPLOYMENT OF LEARNERS AT SUBMINIMUM WAGE RATES:

The conditions governing the issuance of a certificate by the U. S. Department of Labor authorizing the employment of learners at wage rates below the statutory minimum are described in Section 522.5 of 29 CFR Part 522, Employment of Learners, as follows:

Section 522.5: Conditions governing issuance of a learner certificate.

The following conditions shall govern the issuance of a special certificate authorizing the employment of learners at subminimum wage rates:

(a) An adequate supply of qualified experienced workers is not available for employment; the experienced workers presently employed in the plant in occupations in which learners are requested are afforded an opportunity, to the fullest extent possible, for full-time employment; learners are available for employment; and the granting of a certificate is necessary in order to prevent curtailment of opportunities for employment.

(b) Reasonable efforts have been made to recruit experienced workers, including the placement of an order with the local State or Territorial Public Employment Service Office (except in possessions where there is no such office) not more than fifteen days prior to the date of application. Written evidence from such office that the order has been placed shall be submitted by the employer with the application.

(c) The issuance of a learner certificate will not tend to create unfair competitive labor cost advantages nor have the effect of impairing or depressing wage or working standards established for experienced workers for work of a like or comparable character in the industry.

(d) Abnormal labor conditions such as a strike, a lock-out, or other similar condition, do not exist at the plant for which a learner certificate is requested.

(e) There are no serious outstanding violations of the provisions of a learner certificate previously issued to the company, nor have there been any serious violations of the act which provide reasonable grounds to conclude that the terms of a certificate may not be complied with, if issued.

(f) The occupation or occupations in which learners are to receive training involve a sufficient degree of skill to necessitate an appreciable training period.

(g) Learners shall be afforded every reasonable opportunity for continued employment upon completion of the learning period.



U. S. Tariff Commission

PROPOSED CHANGES IN IMPORT TARIFF SCHEDULES INCLUDE FROZEN FISH BLOCKS AND MONOFILAMENT GILL NETS:

A proposal for a Fourth Supplemental Report of changes in the Tariff Schedules of the United States necessary to reflect changes made in the tariff treatment of imported articles as set forth by various statutes and administrative and judicial rulings has been made public. The notice by the U.S. Tariff Commission was published in the Federal Register of October 31, 1962.

The only fishery product listed is frozen fish slabs, and the description reads: "skinned or boned, whether or not divided into pieces, and frozen into slabs each weighing over 10 pounds, imported to be minced, ground, or processed into fish sticks." The proposed change will remove the fish slabs or blocks from items Number 110.50, 110.55, 110.57, 110.60, 110.61, and establishes a new class 110.47. "The change incorporates the substance of customs practices based upon recent court rulings (Customs Decisions 2327 and 2340). The principle of these rulings cannot be effectively administered except by following the fish into consumption." These decisions provide for entry of fish blocks or slabs under paragraph 720(b) of the Tariff Act of 1930 which carries a rate of 1 cent a pound rather than duties which could range from $1\frac{1}{4}$ to $2\frac{1}{2}$ cents a pound under paragraph 717(b).

Also listed are monofilament gill nets, and the change provides for the free importation of that type net for fish sampling.

A public hearing was held on November 16, 1962, in the Tariff Commission Building, Washington, D. C.



Treasury Department

COAST GUARD

AMENDED FEDERAL REGULATIONS FOR PORT SECURITY CARDS:

A change has been announced in the Federal Regulations for Coast Guard Port Security Cards. The new regulations became effective on publication in the Federal Register of November 15, 1962.

(a) Only the following persons may be issued Coast Guard Port Security Cards:

1. Persons regularly employed on vessels or on waterfront facilities.
2. Persons having regular public or private business connected with the operation, maintenance, or administration of vessels, their cargoes, or waterfront facilities.

(b) A holder of a Merchant Mariner's Document, Validated for Emergency Service, shall not be issued a Port Security Card, unless he surrenders the Merchant Mariner's Document to the Coast Guard. In this connection, see Section 125.09.

The regulations are covered by Title 33--Navigation and Navigable Waters, Chapter 1--Coast Guard, Department of the Treasury, Subchapter L, Section 125.17.



Eighty-Seventh Congress

(Second Session)

The 87th Congress adjourned "sine die" on October 13, 1962. Bills not completed during this Congress are "dead" and do not carry over to the 88th Congress, which will convene on January 9, 1963. This means that bills if and when reintroduced must go through the entire process of committee consideration, hearings etc.

GLOUCESTER HARBOR (MASS.) IMPROVEMENT: H. Doc. 341. Gloucester Harbor, Massachusetts, Letter from the Secretary of the Army transmitting a letter from the Chief of Engineers, Department of the Army, dated Oct. 6, 1961, submitting a report, together with accompanying papers and an illustration, requested by resolutions of the Committee on Public Works, House of Representatives, adopted Mar. 30, 1955.

GREAT LAKES HARBORS STUDY: H. Doc. 340. Great Lakes Harbors Study--Second Interim Report on Erie Harbor, Pennsylvania, Letter from the Secretary of the Army transmitting a letter from the Chief of En-

gineers, Department of the Army, Dated Oct. 6, 1961, submitting a report, together with accompanying papers and an illustration, requested by resolutions of the Committees on Public Works, United States Senate and House of Representatives, adopted May 18, 1956 and June 27, 1956.

H. Doc. 415, Great Lakes Harbors Study--Interim Report on Conneaut Harbor, Ohio, Letter from the Secretary of the Army transmitting a letter from the Chief of Engineers, Department of the Army, dated Jan. 17, 1962, submitting a report, together with accompanying papers and an illustration, requested by resolutions of the Committees on Public Works, United States Senate and House of Representatives, adopted May 18, 1956, June 27, 1956, and June 3, 1959, respectively. It is also in full response to a resolution of the Committee on Public Works, House of Representatives, adopted Apr. 13, 1948.

H. Doc. 496, Great Lakes Harbors Study--Interim Report on Kenosha Harbor, Wisconsin, Letter from the Secretary of the Army transmitting a letter from the Chief of Engineers, Department of the Army, dated June 20, 1962, submitting a report, together with accompanying papers and an illustration, requested by resolutions of the Committees on Public Works, United States Senate and House of Representatives, adopted May 18, 1956, April 30, 1957, and June 27, 1956. It is in final response to a resolution of the Committee on Public Works, House of Representatives, adopted July 31, 1957.

H. Doc. 474, Great Lakes Study--Interim Report on the Muskegon Harbor, Michigan, Letter from the Secretary of the Army transmitting a letter from the Chief of Engineers, Department of the Army, dated Apr. 30, 1962, submitting a report, together with accompanying papers and an illustration, requested by resolutions of the Committees on Public Works, United States Senate and House of Representatives, adopted May 18, 1956, and June 27, 1956.

H. Doc. 451, Great Lakes Harbors Study--Second Interim Report on the Buffalo Harbor, New York, Letter from the Secretary of the Army transmitting a letter from the Chief of Engineers, Department of the Army, dated May 18, 1962, submitting a report, together with accompanying papers and an illustration, requested by resolutions of the Committees on Public Works, United States Sen-



ate and House of Representatives, adopted May 18, 1956 and June 27, 1956.

HARBOR IMPROVEMENTS: S. Doc. 106, Key West Harbor, Florida, Letter from the Secretary of the Army transmitting a letter from the Chief of Engineers, Department of the Army, dated June 1, 1962, submitting a report, together with accompanying papers and an illustration, requested by a resolution of the Committee on Public Works, United States Senate, adopted Mar. 15, 1951.

H. Doc. 500, Searsport Harbor, Maine, Letter from the Secretary of the Army transmitting a letter from the Chief of Engineers, Department of the Army, dated June 22, 1962, submitting a report, together with accompanying papers and an illustration, requested by a resolution of the Committee on Public Works, House of Representatives, adopted June 3, 1959.

H. Doc. 482, Portsmouth Harbor and Piscataqua River, Maine and New Hampshire, Letter from the Secretary of the Army transmitting a letter from the Chief of Engineers, Department of the Army, dated June 1, 1962, submitting a report, together with accompanying papers and illustrations, requested by resolutions of the Committees on Public Works, United States Senate and House of Representatives, adopted Nov. 18, 1958, and June 3, 1959.

S. Doc. 101, Tacoma Harbor, Port Industrial and Hylebos Waterways, Washington, Letter from the Secretary of the Army trans-

mitting a letter from the Chief of Engineers, Department of the Army, dated May 4, 1962, submitting a report, together with accompanying papers and illustrations, requested by a resolution of the Committee on Public Works, United States Senate, adopted May 27, 1955.

MEDICAL CARE FOR VESSEL PERSONNEL: Medical Care for Self-Employed Fishermen (Hearing before the Merchant Marine and Fisheries Subcommittee of the Committee on Commerce, U. S. Senate, 87th Congress, 2nd Session, on S. 367, to provide medical care for certain persons engaged on board a vessel in the care, preservation, or navigation of such vessel May 2, 1962), 90 pp., printed. Contains statements given by personnel of various Federal agencies and industry people; letters and various other correspondence submitted to the Committee; and reports from Federal agencies.

TRADE EXPANSION ACT OF 1962: H. Doc. 598, Free Trade, Tariff Legislation, and Common Markets for the Western Hemisphere: A Collection of Excerpts and Selected References, House of Representatives, 87th Congress, 2nd Session, 76 pp., printed (prepared by the Economics Division, Legislative Reference Service, Library of Congress). Contains excerpts and selected bibliography on free trade and protective tariffs, the 1962 trade expansion legislative proposals, and excerpts and selected references on Western Hemisphere common markets.



Created in 1849, the Department of the Interior--America's Department of Natural Resources--is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States--now and in the future.

FISHERY INDICATORS

CHART 1 - FISHERY LANDINGS for SELECTED STATES

In Millions of Pounds

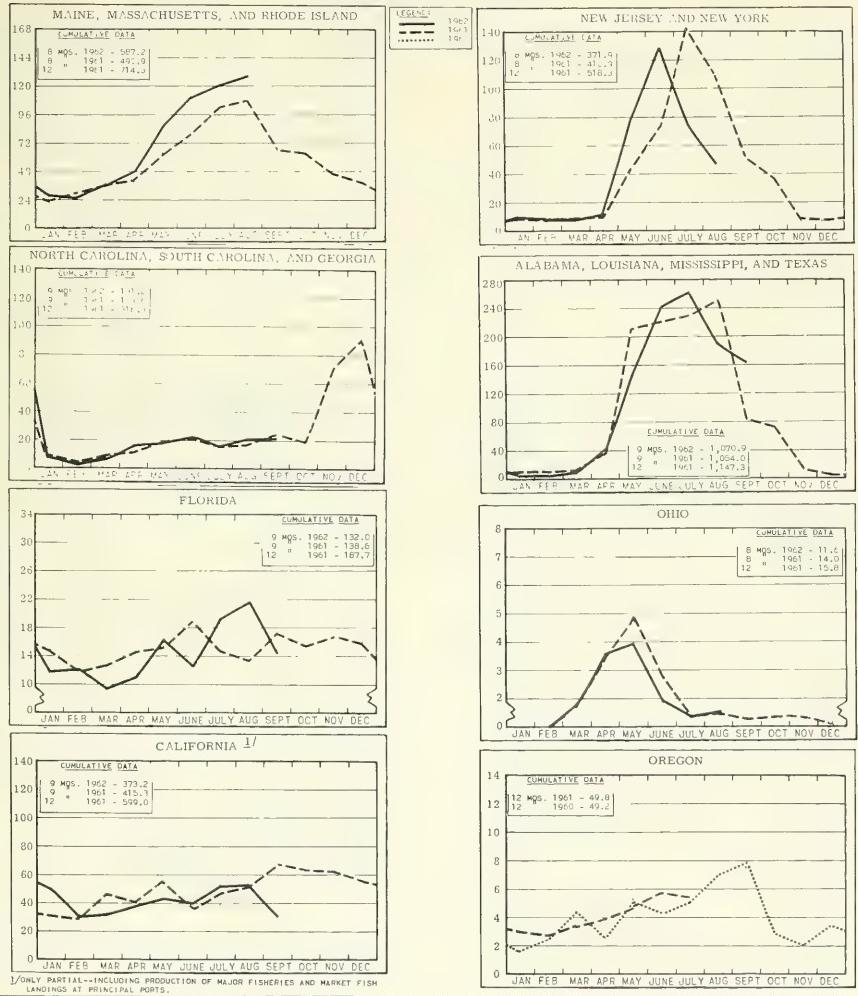
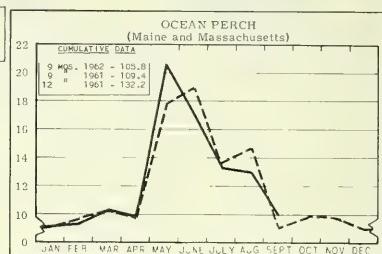
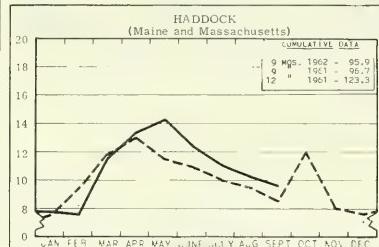
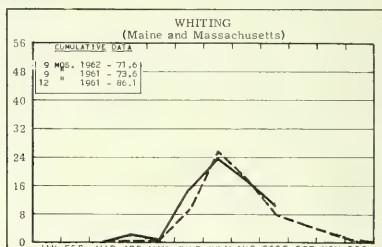
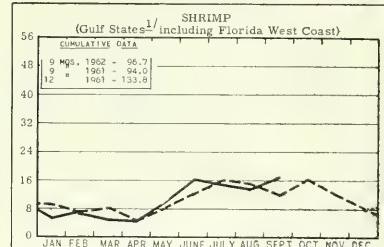


CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

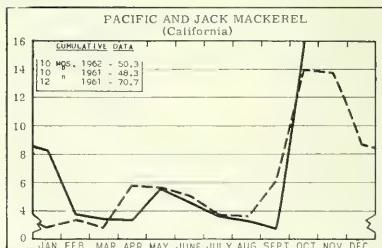
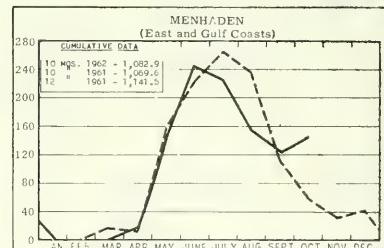


In Millions of Pounds



^{1/}LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



In Thousands of Tons

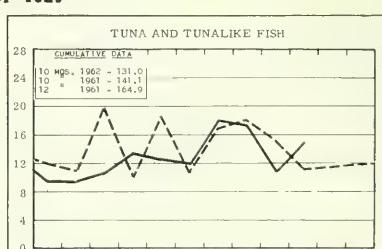
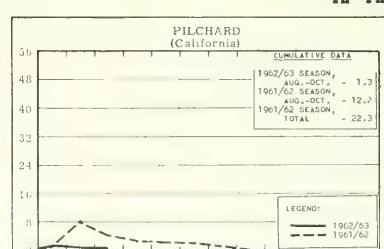
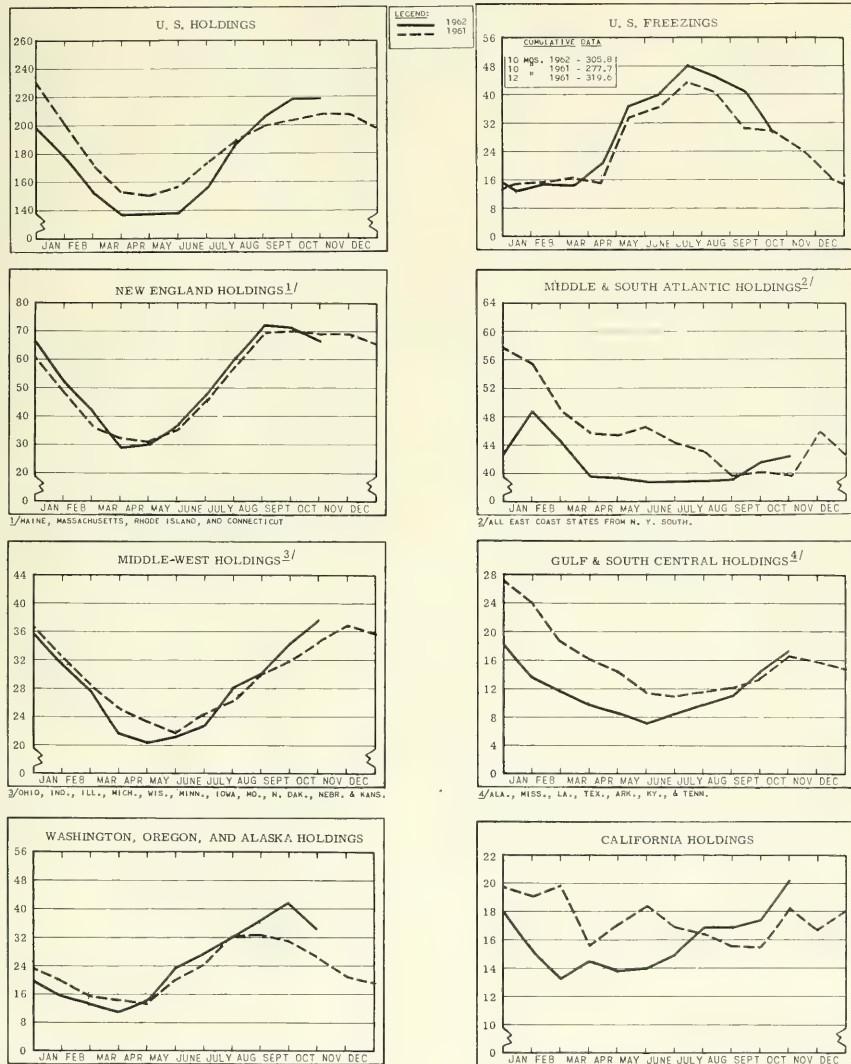


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

In Millions of Pounds



* Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

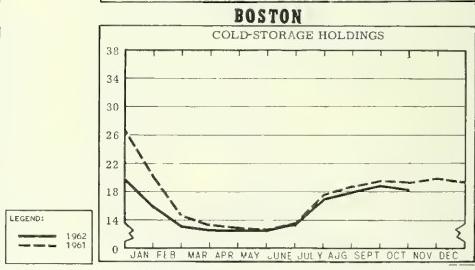
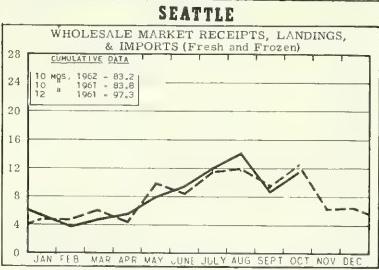
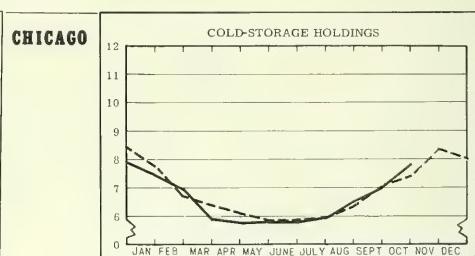
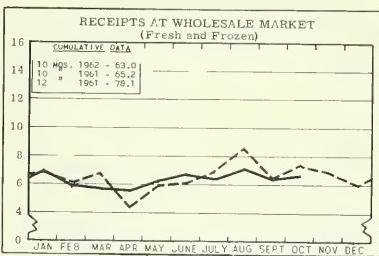
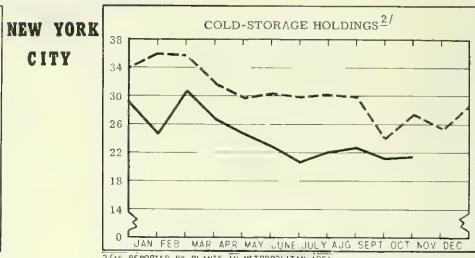
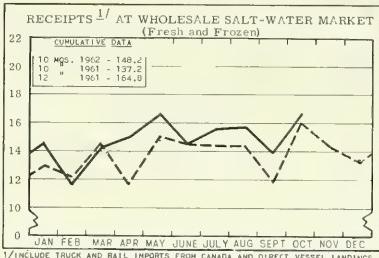


CHART 5 - FISH MEAL and OIL PRODUCTION

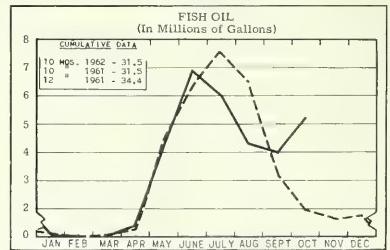
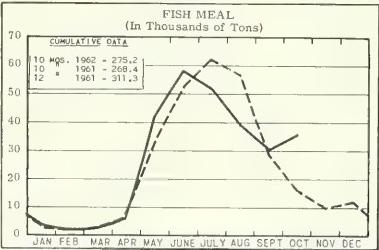
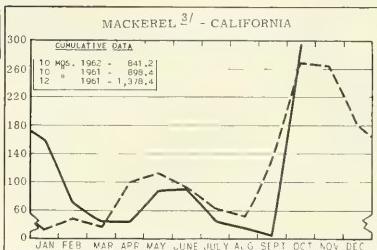
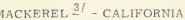
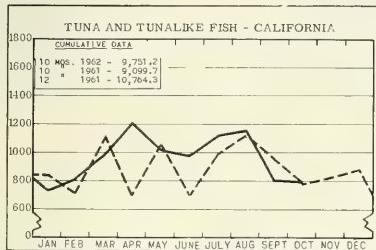
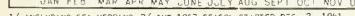
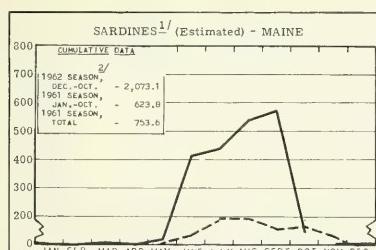
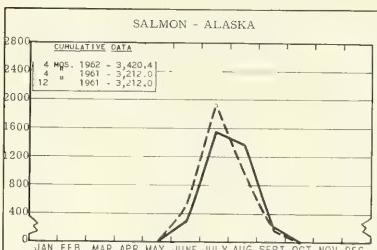
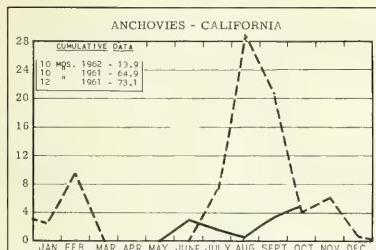


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases



3/ INCLUDES PACIFIC HADDEREL AND JACK MACKEREL



STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	$\frac{1}{4}$ drawn	3 $\frac{1}{2}$ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# $\frac{1}{2}$ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES....	48	1-lb.	6 oz.

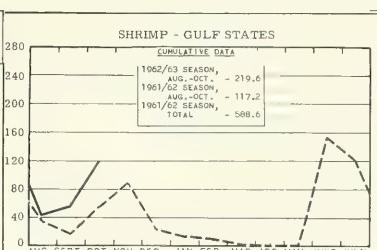
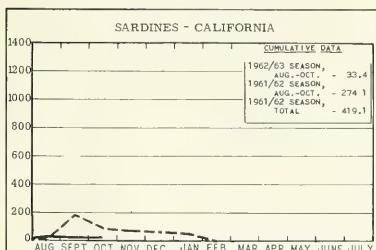
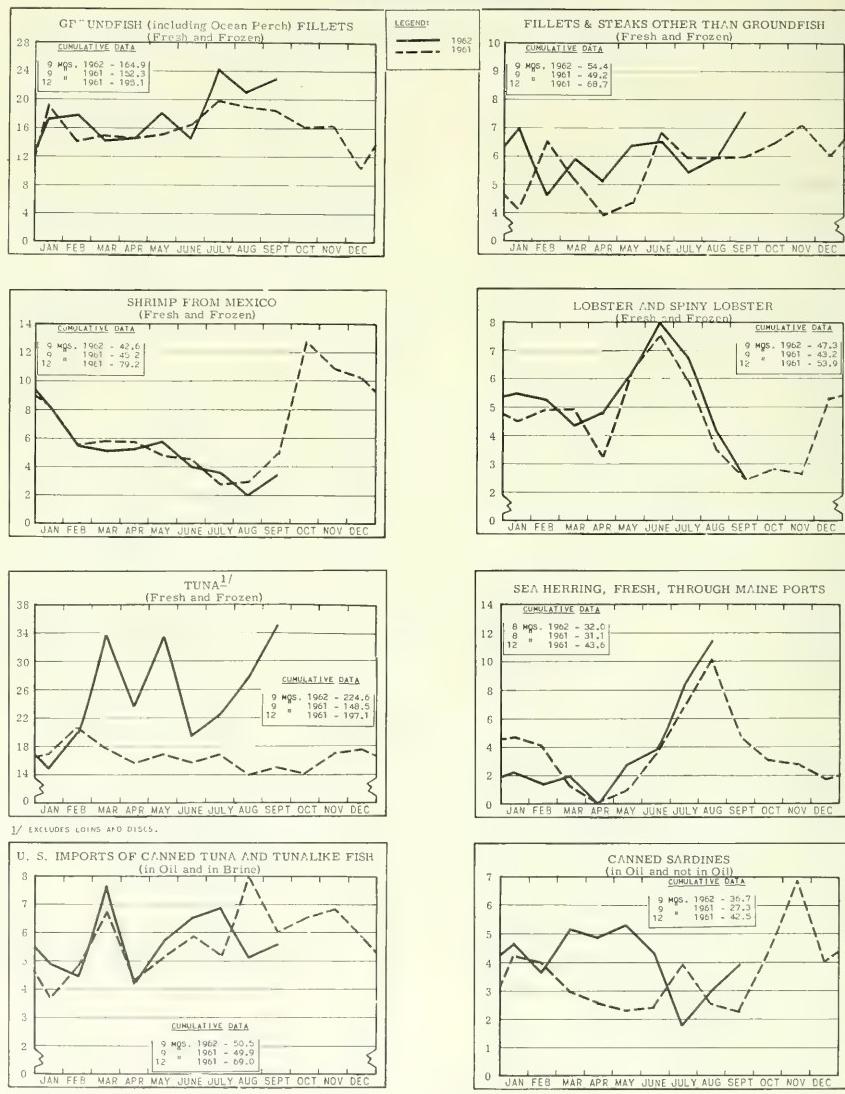


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds



RECENT

FISHERY PUBLICATIONS

FISH AND WILDLIFE SERVICE
PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

- CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
- FL - FISHERY LEAFLETS.
- MNL - REPRINTS OR REPORTS ON FOREIGN FISHERIES.
- SEP - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
- SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
- SSR - FISH - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

Number	Title
CFS-2977	Massachusetts Landings, May 1962, 5 pp.
CFS-2980	Frozen Fish Report, August 1962, 8 pp.
CFS-2986	Fish Meal and Oil, July 1962, 2 pp.
CFS-2987	Middle Atlantic Fisheries, 1961 Annual Summary, 7 pp.
CFS-2989	New York Landings, July 1962, 4 pp.
CFS-2991	Maine Landings, July 1962, 4 pp.
CFS-2992	Wisconsin Landings, July 1962, 2 pp.
CFS-2995	Ohio Landings, July 1962, 2 pp.
CFS-2997	Mississippi Landings, July 1962, 3 pp.
CFS-2998	Virginia Landings, July 1962, 3 pp.
CFS-3001	Alabama Landings, June 1962, 3 pp.
CFS-3002	Alabama Landings, July 1962, 3 pp.
CFS-3003	Michigan Landings, June 1962, 3 pp.
CFS-3004	Louisiana Landings, April 1962, 2 pp.
CFS-3007	Maryland Landings, August 1962, 3 pp.
CFS-3008	North Carolina Landings, August 1962, 3 pp.
CFS-3009	South Carolina Landings, August 1962, 2 pp.
CFS-3011	Georgia Landings, August 1962, 2 pp.
CFS-3012	New Jersey Landings, July 1962, 3 pp.
CFS-3014	Wisconsin Landings, August 1962, 2 pp.
CFS-3015	Fish Meal and Oil, August 1962, 2 pp.
FL-176	Atlantic Salmon (<i>Salmo salar</i>), 3 pp., June 1962 (Revised).
FL-448	Some Publications on Fish Culture and Related Subjects, 13 pp., June 1962 (Revised).

FL-537 - A List of the Fishery Bulletins of the United States Fish and Wildlife Service, by L. T. Dees, 16 pp., April 1962. The Fishery Bulletins are technical reports of scientific investigations of fishery biology. The Bulletin of the United States Fish Commission was begun in 1881. It became the Bulletin of the Bureau of Fisheries in 1904 and the Fishery Bulletin of the Fish and Wildlife Service in 1941. Paging is serially by volumes. Through volume 46, separates were issued as Documents, each with a

Document number. Beginning with volume 47, each separate was issued as a numbered Bulletin. Fishery Bulletins are distributed to depository libraries and are sold by the Superintendent of Documents, Washington 25, D. C.

FL-540 - List of Fishery Leaflets of the U. S. Fish and Wildlife Service, by Lola T. Dees, 37 pp., May 1962. Fishery Leaflets are correspondence aids giving information on fishes and fisheries. In this report the latest issue or revision of each leaflet is listed, without reference to the original issue. Available fishery leaflets may be obtained without charge from the U. S. Fish and Wildlife Service.

Sep. No. 659 - Progress Report on Midwater Trawling Studies Carried Out Off the New England Coast in 1961 by M/V Delaware.

Sep. No. 660 - The Stockfish and Spiny Lobster Fisheries of South Africa.

Firms Canning, 1961 (Revised):

- SL-101 - Salmon, 3 pp.
- SL-111 - Clam Products, 2 pp.
- SL-112 - Shrimp, 2 pp.
- SL-113 - Crab Meat, 2 pp.

SSR-Fish. No. 397 - Winter Water Temperatures and an Annotated List of Fishes - Nantucket Shoals to Cape Hatteras, Albatross III Cruise No. 126, by Robert L. Edwards, Robert Livingstone, Jr., and Paul E. Hamer, 34 pp., illus., September 1962.

SSR-Fish. No. 399 - Some Effects of DDT on the Guppy and the Brown Trout, by Susan Frances King, 24 pp., illus., processed, March 1962.

SSR-Fish. No. 412 - Distribution of Fish Eggs and Larvae, Temperature, and Salinity in the Georges Bank-Gulf of Maine Area, 1956, by Robert R. Marak and others, 98 pp., illus., March 1962.

SSR-Fish. No. 415 - Pacific Tuna Biology Conference (August 14-19, 1961, Honolulu, Hawaii), edited by John C. Marr, 50 pp., processed, May 1962. A report of the work and results of the Pacific Tuna Biology Conference, held at the University of Hawaii in August 1961 under the auspices of the Bureau of Commercial Fisheries Biological Laboratory, Honolulu, and attended by tuna research workers and fishery experts from 11 countries. The report comprises a general account of the proceedings of the Conference; summaries of the discussions in 6 general sessions on distribution, migrations, sub-populations, behavior, tuna oceanography, and tax-

onomy and nomenclature; the reports of 2 special working groups, on identification of larval and juvenile tunas and on taxonomy and nomenclature; resolutions adopted by the Conference; abstracts of the 50 papers presented; and a list of the participants.

SSR-Fish. No. 418 - Use of Mobile Bioassay Equipment in the Chemical Control of Sea Lamprey, by John H. Howell and Willman M. Marquette, 13 pp., illus., April 1962.

SSR-Fish. No. 419 - Annual Fish Passage Report -
Rock Island Dam, Columbia River, Washington,
1960, by Paul D. Zimmer and Clifton C. Davidson,
25 pp., illus., April 1962.

Common Parasites of Fishes, by Glenn L. Hoffman
and Carl J. Sindermann, Circular 144, 19 pp., illus.,
1962.

Monthly Mean Charts, Sea Surface Temperature, North Pacific Ocean, Circular 134, 41 pp., illus., printed April 1962, limited distribution. The historical charts of monthly sea surface temperature in the North Pacific Ocean for 1956 and 1957 contain mean temperature data and isotherms. Also included are 12 charts showing the temperature change from each month in 1956 to the corresponding month in 1957. According to the report, the 1956-1957 period was selected for initial treatment because of widespread scientific interest in the warming which began in 1957 along the eastern boundaries of the North Pacific Ocean.

Something About--Fish, Wildlife--and You, 2 pp., illus., processed, 1962. A leaflet, intended for Girl Scouts, which discusses the importance of conservation of our fish and wildlife resources. Emphasizes the responsibility of every citizen in furthering the conservation cause. Describes the role of the Fish and Wildlife Service's National Wildlife Refuges, National Fish Hatcheries, research laboratories, exploratory fishing and research vessels, and other facilities in conservation.

Something About--the Sea, 2 pp., illus., processed, 1962. A leaflet describing the sea, its resources, typography, and movements. Discusses the food chain, peaks and valleys in the oceans' floors, ocean currents, erosion of the coastlines by the seas, and the upwellings of water from the oceans' depths.

THE FOLLOWING MARKET NEWS LEAFLET IS AVAILABLE FROM THE
FISHERY MARKET NEWS SERVICE, U. S. FISH AND WILDLIFE SERVICE,
SUITE 611, 777 14TH ST. NW., WASHINGTON 5, D. C.

Number Title
MNL-17 - Italian Fishing Industry, 1960-61, 8 pp.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE BIOLOGICAL LABORATORY, BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, BOOTH BAY HARBOR, MAINE.

Preliminary Results of the "Forfangst" and Fat-Herring Investigations in Summer of 1954, by Olaf Dragesund, 11 pp., processed, 1957. (Translated from Fiskets Gang, vol. 41, no. 23, June 1955, pp. 317-322.)

The Recruitment of the Herring Stocks and the Growth of the Spring and Autumn Herring in the Western

Baltic, by Rudolph Kandler, 16 pp., illus., processed, 1957. (Translated from the German, Monatshefte fur Fischerei, vol. 10, no. 2, pp. 17-22.)

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE
ARTICLE IS AVAILABLE ONLY FROM THE U. S. BUREAU OF COMMERCIAL
FISHERIES BIOLOGICAL LABORATORY, BOX 3830, HONOLULU, HAWAII.

Gorbusha (Pink Salmon) - ONCORHYNCHUS GORBUSCHA (Walbaum), by L. S. Berg, English Translations of Fishery Literature, Miscellaneous Series No. 365, 5 pp., printed, 1956. (Translated from the Russian, Promsvyazby RYSSR, 1949, pp. 154-156.)

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE
ARTICLE IS AVAILABLE ONLY FROM THE U. S. FISH AND WILDLIFE SERVICE,
BUREAU OF COMMERCIAL FISHERIES, BIOLOGICAL LABORATORY,
SEATTLE, WASHINGTON.

Saika (Polar Cod), BOREOGADUS SAIDA (Lepechin),
by L. S. Berg and others, 7 pp., printed, 1957.
(Translated from the Russian, Promyslovye Ryby
SSSR, 1949, pp. 519-521.)

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE
SPECIFIC OFFICE MENTIONED.

Annual Report of Sealing Operations, 1962, Pribilof Islands, Alaska. 17 pp., processed, October 1, 1962. (Bureau of Commercial Fisheries, U. S. Fish and Wildlife Service, 6116 Arcade Bldg., Seattle 1, Wash.) Discusses kill of commercial bachelor seals, age composition, regular or bachelor season, kill of female seals, mortality among young-of-the-year, expectations for 1963, labor imported for seal killing and skin curing, and materials used in curing. Also discusses rejection of seals from killing drive, byproducts, remuneration of employees, details of daily kills, and time spent on sealing operations. Including statistical tables showing distribution of sealskins, counts of bull seals, blubber reserved for sealskin processing, ages of male seals comprising kill, abstracts of seals killed on St. Paul and St. George Islands, and time report of sealing operation.

(Baltimore) Monthly Summary--Fishery Products, August 1962, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore 2, Md.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market, for the month indicated.

California Fishery Market News Monthly Summary.
Part I - Fishery Products Production and Market Data, August 1962, 17 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; Oregon and Washington receipts (domestic and imports) of fresh and frozen tuna and tunalike fish; for the month indicated.

(Chicago) Monthly Summary of Chicago's Wholesale
Market Fresh and Frozen Fishery Products Receipts,
Prices, and Trends, July, August, September 1962,
13 pp. ea. (Market News Service, U. S. Fish and

Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the months indicated.

Fish Protein Concentrate, Lifeline of the Future, 6 pp., illus., printed, September 1962. (Branch of Technology, U. S. Bureau of Commercial Fisheries, Washington 25, D. C.) Fish protein concentrate (FPC) is the name for a group of possible products from dehydrated and defatted fish. It may be rendered tasteless, odorless, and colorless and the final product can range from a fine powder to one of granular consistency. It is an excellent source of high quality protein. This leaflet discusses the role of fish protein concentrate in the complete utilization of the fishery resource, hunger as the biggest human problem of the century, doubling of the world population in the next 40 years, and the inability of land food resources to supply needs. It also discusses the sea as the key to an immediate solution, the immense potential of fish protein concentrate, some notable efforts at FPC manufacture, and the need for a more vigorous research and development program.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, September 1962, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 609 South St., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; and sponge sales; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, September 1962, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--June, July 1962, 18 pp. ea. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the months indicated.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, September 1962, 9 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle 4, Wash.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the

International Pacific Halibut Commission; landings of otter-trawl receipts reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

Status of Fish Tagging and Tagging Techniques, U. S. Dept. of the Interior, Fish and Wildlife Service, Bureau of Commercial Fisheries, Woods Hole, Massachusetts, for the Period 1957 through 1961, by S. Cogswell, Woods Hole Laboratory Report No. 62-2, 23 pp., printed, 1962. (U. S. Bureau of Commercial Fisheries, Biological Laboratory, Woods Hole, Mass.)

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON 25, D. C.

Chronic Effects of Endrin on Bluntnose Minnows and Guppies, by Donald Irvin Mount, Research Report 58, 42 pp., illus., 35 cents, 1962.

"A Comparative Study of the Blood of Wild and Hatchery-Reared Lake Trout," by Robert G. Piper and Robert F. Stephens, article, Progressive Fish-Culturist, vol. 24, no. 2, 1962, pp. 81-84, processed, 25 cents.

"Experimental Heating of Pond Water to Start Rainbow Trout Fry on a Dry Diet," by Kenneth E. Morton, article, Progressive Fish-Culturist, vol. 24, no. 2, 1962, pp. 94-96, processed, 25 cents.

Federal Aid in Fish Restoration, Regulatory Announcement 65, 22 pp., printed, 15 cents, 1962.

Federal Aid in Wildlife Restoration, Regulatory Announcement 64, 21 pp., printed, 15 cents, 1962.

"Growth Rate of Brook Trout at Different Population Densities in a Small Infertile Stream," by Edwin L. Cooper, Joseph A. Boccardi, and John K. Andersen, article, Progressive Fish-Culturist, vol. 24, no. 2, 1962, pp. 74-80, processed, 25 cents.

"The Indispensable Amino Acids for Rainbow Trout," by Warren E. Shanks, George D. Gahimer, and John E. Halver, article, Progressive Fish-Culturist, vol. 24, no. 2, pp. 68-73, processed, 25 cents.

"A Method for Force-Feeding Radioisotopes to Yearling Trout," by R. E. Nakatani, article, Progressive Fish-Culturist, vol. 24, no. 2, 1962, pp. 56-59, processed, 25 cents.

Predicting Year-Class Abundance of Yellowstone Lake Cutthroat Trout, by Ross V. Bulkley and Norman G. Benson, Research Report 59, 25 pp., illus., 25 cents, 1962.

Sexual Maturity and Spawning of the Albacore in the Central South Pacific Ocean, by Tamio Otsu and Richard J. Hansen, Fishery Bulletin 204 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 62), 11 pp., illus., printed, 15 cents, 1962.

"Some Observations of the Feeding Habits of Brown Trout," by F. Phillip Sharpe, article, Progressive

Fish Culturist, vol. 24, no. 2, 1962, pp. 60-64, processed, 25 cents.

"Supplemental Feeding of Fingerling Channel Catfish," by Otto W. Tiemeier, article, *Progressive Fish-Culturist*, vol. 24, no. 2, 1962, pp. 88-90, processed, 25 cents.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ABALONE:

"Muscle Extract of Aquatic Animals. IV--Distribution of Nitrogenous Constituents in the Muscle Extracts of an Abalone, *Halichoeres gigantea* *Discus* Reeve," by Shoji Konosu and Yasuhiko Maeda, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 27, March 1961, pp. 251-254, printed. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

AFGHANISTAN:

Import Tariff System of Afghanistan, WTIS Part 2, Operations Report No. 62-47, 2 pp., printed, 15 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., September 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses units of currency, weights and measures; bases of specific and ad valorem duties; method of payment of duty; customs surtaxes; sales and other internal taxes; preferential duties; consular documents and fees; trade restrictions; and other information.

ALASKA:

Kitoi Bay Research Station, Its Development, Accomplishments and Future, by Howard D. Tait, Informational Leaflet No. 9, 6 pp., processed. Division of Biological Research, Alaska Department of Fish and Game, Juneau, Alaska, February 23, 1962. Discusses the purpose and facilities of the Laboratory; current research activities--lake rehabilitation studies, pink salmon studies, and predator studies; and future plans.

ALGAE:

"An Approach to Sea Farming," by Alan D. Ansell, article, *Fisheries Newsletter*, vol. 21, no. 9, September 1962, pp. 17-18, 26, illus., printed. Commonwealth Office of Fisheries, Department of Primary Industry, Canberra, Australia. A progress report on experiments, using flue gas from a power station and fertilizers, to promote the growth of marine algae, for direct use or for feeding to shellfish. According to the author, "It is possible that combined algal and shellfish culture will present an efficient method of intensive cultivation of small areas of sea water. Clams, or other shellfish, reared under controlled conditions, planted on prepared grounds, protected from enemies and receiving food supplements, would be the main product."

Growth of these shellfish might be further accelerated in some areas by irrigation of the beds with the warm water effluents from industrial cooling systems."

Bibliographic Data Useful in the Study of Marine Algae, by Harold Judson Humm, Special Scientific Report No. 29, 12 pp., printed. Virginia Institute of Marine Science, Gloucester Point, Va., 1962.

Contribution to the Study of the Marine Algae of Ceylon, by M. Durairatnam, Bulletin No. 10, 181 pp., illus., printed, Department of Fisheries, Fisheries Research Station, Colombo, Ceylon, 1961.

Key to the Genera of Marine Bluegreen Algae of Southeastern North America, by Harold Judson Humm, Special Scientific Report No. 28, 6 pp., printed. Virginia Institute of Marine Sciences, Gloucester Point, Va., 1962.

"Preliminary Survey of Fungistic Properties of Marine Algae," by Ann Marie Welch, article, *Journal of Bacteriology*, vol. 83, January 1962, pp. 97-99, printed. Society of American Bacteriologists, Mount Royal and Guildford Aves., Baltimore 2, Md.

ANGOLA:

Sobre a Ocorrência de *SARDINOPS OCELLATA* (Pappe) em Águas Centro-Angolanas (On the Occurrence of *Sardinops ocellata* (Pappe) in the Waters of Central Angola), by R. Monteiro, Notas Mimeografadas, no. 25, 12 pp., illus., processed in Portuguese with English summary. Centro de Biologia Piscatoria, Lisbon, Portugal, 1962.

ANTIBIOTICS:

"Antibiotics as Food Preservatives," by R. H. Vaughn, and G. F. Stewart, article, *Journal of the American Medical Association*, vol. 174, 1960, pp. 1308-1310, printed. *Journal of the American Medical Association*, 535 N. Dearborn Ave., Chicago 10, Ill.

"Gli antibiotici nella conservazione dei prodotti ittici. Effetti delle carni d'Aureomicina sui processi di alterazione della carne di pesce" (Antibiotics in the Preservation of Fish Products: Effects of Aureomycin on the Decomposition of Fish Meat), by C. M. Ricotta, article, *Conservi e Derivati Agrumari*, vol. 9, no. 1, 1960, pp. 18-20, printed in Italian. Centro Sperimentale per l'Industria della Pesca e dei Prodotti del Mare, Palermo, Sicily, Italy.

AQUATIC SCIENCES:

"A Developing Aquatic Sciences Information Retrieval System," by Joel S. O'Connor, and Saul B. Saila, article, *Transactions of the American Fisheries Society*, vol. 91, no. 2, 1962, pp. 151-154, printed. American Fisheries Society, 233 Broadway, New York, N. Y.

ARGENTINA:

"La Pesca en el Mar Argentino" (The Fishery in Argentine Waters), by Juan Manuel Gordini, article, *Pesca y Marina*, vol. 14, no. 4, August-September 1962, pp. 4-8, illus., printed in Spanish. Pesca y Marina, Fernando Flores Ltd., 705 N. Windsor Blvd., Los Angeles 38, Calif.

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"Quick-Freezing in France," by M. Anquez, article, *Revue Generale du Froid*, vol. 39, no. 1, January 1962, pp. 17-22, printed in French. *Association Nationale des Ingénieurs et Techniciens du Froid et des Industries Connexes*, 129 Blvd. St. Germain, Paris VI, France. Discusses the early development of quick-freezing of foods, particularly fish. Covers the present situation in the industry, including production capacity of food freezers in France, national production in 1960, cold-storage capacity, long-distance transport and retail delivery of frozen foods. Reasons for relatively low development of frozen products, and efforts by various organizations to promote the industry are also covered.

FRESH-WATER FISH:

"Flavor and Aroma of Fish Taken from Four Fresh-Water Sources," by Ruth E. Baldwin, Dorothy H. Strong, and James H. Torrie, article, *Transactions of the American Fisheries Society*, vol. 90, no. 2, 1961, pp. 175-180, printed. *American Fisheries Society*, 233 Broadway, New York, N. Y.

"Underwater Competition," by Phil Dotson, article, *Utah Fish and Game*, vol. 18, no. 9, September 1962, pp. 6-7, illus., printed, single copy 25 cents. Utah State Department of Fish and Game, 1596 W. North Temple, Salt Lake City 16, Utah. Describes briefly the game fish's struggle for survival, and the role of the fishery biologist in properly managing fisheries resources. The author states that "To manage fishery resources effectively fisheries biologists must understand how fish compete with each other for available food, and how they must compete for spawning areas, space, oxygen, cover, and other vital requirements."

FROZEN FOODS:

Frozen Foods in Food Service Establishments, by Kirby M. Hayes and others, *Food Management Program Leaflet 2*, 23 pp., illus., printed. Cooperative Extension Service, College of Agriculture, University

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

of Massachusetts, 408 Atlantic Ave., Boston 10, Mass. According to the authors, "Frozen foods are increasingly important in modern food service establishments. Larger supplies, continuing research, and greater availability of many types of frozen foods make possible regular and expanding menu uses. The use of frozen foods in restaurants, hotels, and other eating places has brought changes in food preparation and cooking methods. These have come as food service operators capitalize on advantages offered by frozen foods, while at the same time adopting procedures to minimize the disadvantages. Effective use of frozen foods requires a good knowledge of these advantages and disadvantages. It also requires the use of appropriate ordering, handling, storing, preparation, and cooking procedures. It is the purpose of this leaflet to suggest ways in which food service operators can use frozen foods to best advantage." Includes information on thawing and cooking of frozen fish and shellfish, how temperatures affect them, and their storage life at 0° F.

GEAR:

"Les engins de peche--les palangres" (Fishing Gear--Long-Lines), by A. Percier, article, *France Peche*, vol. 7, no. 64, July-August 1962, pp. 75-76, illus., printed in French. France Peche, Service Abonnement, Boite Postale 179, Lorient (Morbihan), France.

"Novyi tip problekovogo fonara dla oboznamcheniya promyslovyykh buyev" (New Type of Flashing Lamp for Marking Fishing Buoyes), by Iu. I. Bykhoovskii, article, *Rybnoe Khoziaistvo*, vol. 35, no. 6, 1959, pp. 47-50, illus., printed in Russian. VNIRO, Glavniproektka, pri Gosplanie SSSR, Moscow, U.S.S.R.

"Predokhranitelnoe ustroystvo k tralu" (Protective Gear for Trawl), by L. I. Denisov, article, *Rybnoe Khoziaistvo*, vol. 35, no. 11, 1959, pp. 46-47, illus., printed in Russian. VNIRO Glavniproektka, pri Gosplanie SSSR, Moscow, U.S.S.R.

Studies of Factors Influencing Catching Potential of Salmon and Trout Fishing Gear, by Marian Szatynko, OTS 60-21364, 30 pp., illus., processed, 50 cents. (Translated from the Polish, *Prace Morskiego Instytutu Rybackiego w Gdyni*, no. 9, 1957, pp. 565-596.) Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., 1961.

"Use of Gill-Net Rollers in Fishery Investigations," by Gordon F. Hartman, article, *Transactions of the American Fisheries Society*, vol. 91, no. 2, 1962, pp. 224-225, printed. American Fisheries Society, 233 Broadway, New York, N. Y.

GENERAL:

Some Fishes that Survive Extreme Injuries, and Some Aspects of Tenacity of Life, by Gordon Gunter and J. W. Ward, 7 pp., illus., printed. (Reprinted from *Copeia*, no. 4, December 19, 1961, pp. 456-462.) American Society of Ichthyologists and Herpetologists, 18111 Nordhoff St., Northridge, Calif.

GENERAL AGREEMENT ON TARIFFS AND TRADE: GATT Programme for Expansion of International Trade, Agricultural Products, Second and

Third Reports of Committee II, GATT/1962-2, 50 pp., printed, \$1. The Contracting Parties to the General Agreement on Tariffs and Trade, Geneva, Switzerland, 1962. (For sale by the International Documents Service, Columbia University Press, 2960 Broadway, New York 27, N. Y.)

GERMAN FEDERAL REPUBLIC:

Patent Licensing Agreements with Firms in the Federal Republic of Germany and West Berlin, WTIS Part 2, Operations Report No. 62-39, 4 pp., printed, 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., August 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discussed use of patents for direct investment, utilization of patent rights, taxation, and important considerations to be covered in a licensing contract.

GREAT LAKES:

"El Arrastrero de los Grandes Lagos" (The Trawl Fishery in the Great Lakes), article, *Pesca y Marina*, vol. 14, no. 4, August-September 1962, pp. 18-20, illus., printed in Spanish. *Pesca y Marina*, Fernando Flores Ltd., 705 N. Windsor Blvd., Los Angeles 38, Calif.

GROWTH OF FISH:

"O Kharakteristike Rosta Ryb" (Characteristics of Fish Growth), by V. L. Bryuzgin, article, *Voprosy Ikhtiologii*, vol. 15, 1960, pp. 77-90, printed in Russian. Akademia Nauk SSSR, Ikhtiolicheskaya Komissia, Moscow, U.S.S.R.

GULF OF MEXICO:

Gulf Research Reports, vol. 1, no. 3, July 1962, 27 pp., illus., printed. Gulf Coast Research Laboratory, Ocean Springs, Miss. A journal devoted primarily to publication of data of the marine sciences, chiefly of the Gulf of Mexico and adjacent waters. Includes these articles: "Specific Names of the Atlantic American White Shrimp," by Gordon Gunter; "On the Names of *Penaeus setiferus* (L.) and *Penaeus schmitti* Burkenroad," by L. B. Holthuis; "Reply to Dr. L. B. Holthuis on the Names of White Shrimp," by Gordon Gunter; "Studies on the Larval Development of *Rithropanopeus harrisi* (Gould) of the Family Xanthidae (Brachyura)," by M. Roy Hood.

HERRING:

"Bemerkungen zum gegenwartigen Zustand des atlanto-skandinischen Herringbestandes" (Remarks on the Present Status of the Atlantic-Scandinavian Herring Stock), by S. Holzlöhner, article, *Fischerei-Forschung*, vol. 5, no. 2, March-April 1962, pp. 6-11, illus., printed in German. Institut für Hochsee-fischerei und Fischverarbeitung, Rostock-Marienehe, Germany.

Daily Migration of Herring Shoals and Their Reaction to Fishing Gear, by Stanislaw Okonski and Hubert Konkol, OTS 60-21306, 14 pp., illus., processed, 50 cents. (Translated from the Polish, *Prace Morskiego Instytutu Rybackiego w Gdyni*, no. 9, 1957, pp. 549-563.) Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., 1961.

"Destruction of the Reproductive Organs of Herring Caused by Ultrasound under Natural Conditions,"

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

by A. I. Rumyantsev, article, *Doklady*, vol. 134, no. 4, 1960, pp. 955-958, printed in Russian. *Doklady Akademii Nauk SSSR, Podosenski Per. 21, Moscow B-64, U.S.S.R.*

Effect of Salinity on the Sperm, Eggs, and Larvae of the Okhotsk Herring, by L. A. Galkina, OTS 61-31037, 15 pp., illus., processed, 50 cents. (Translated from the Russian, *Izvestiya Tikhookeanskogo nauchno-issledovatel'skogo instituta rybnogo khozyaistva i okeanografii*, vol. 45, 1957, pp. 37-50.) Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., 1962.

Experiments in the Incubation of Baltic Herring Eggs, by M. M. Toom, OTS 61-31040, 13 pp., illus., processed, 50 cents. (Translated from the Russian, *Trudy Vsesoyuznogo nauchno-issledovatel'skogo instituta morskogo rybnogo khozyaistva i okeanografii*, vol. 34, 1958, pp. 19-29.) Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., 1962.

"Results of Scottish Herring Fisheries in 1961 and Prospects for 1962," by B. B. Parrish, A. Saville, and I. G. Baxter, article, *Scottish Fisheries Bulletin*, no. 17, June 1962, pp. 3-12, illus., printed. Marine Laboratory, Department of Agriculture and Fisheries for Scotland, P. O. Box No. 101, Victoria Rd., Aberdeen, Scotland.

"Smasildundersøkelsen i Nord-Norge 1961/62" (Investigation of Small Herring in Northern Norway in 1961/62), by T. Hognestad, article, *Fiskets Gang*, vol. 48, no. 32, August 9, 1962, pp. 453-457, illus., printed in Norwegian. *Fiskets Gang. Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.*

"Swimming Speed of River Herring Pomolobus pseudoharengus (Wilson)," by Robert L. Dow, article, *Journal du Conseil*, vol. 27, no. 1, 1962, pp. 77-80, printed. *Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund-Slot, Denmark.*

HYBRIDIZATION:

Experimental Hybridization Among Three Coregonine Fishes, by E. T. Garside and W. J. Christie, 5 pp., printed. (Reprinted from *Transactions of the American Fisheries Society*, vol. 91, no. 2, April 1962, pp. 196-200.) American Fisheries Society, 233 Broadway, New York, N. Y.

HYDROGRAPHY:

Hydrographic Data from the Atlantic Plankton Cruises of the R/V PATHFINDER, December 1959-December 1960, by Edwin Bibb Joseph and William H. Massmann, Special Scientific Report No. 18, 3 pp., illus., printed. Virginia Fisheries Laboratory, Gloucester Point, Va., 1961.

New Ways of Measuring Salinity and Temperature of Sea Water, by H. Wattenberg and J. Joseph, Trans-34, 12 pp., printed. (Translated from the German, *Annalen der Hydrographie und Maritimen Meteorologie*, 1943, pp. 240-245.) U. S. Navy Hydrographic Office, Washington 25, D. C.

Surface Water Temperature and Salinity, Pacific Coast North and South America and Pacific Ocean

Islands, C&GS Publication 31-3 (First Edition), 73 pp., illus., processed, 45 cents. *Coast and Geodetic Survey, U. S. Department of Commerce, Washington, D. C., 1962.* (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Summaries of sea water temperatures and salinities are based on observations made in Pacific harbor and coastal waters through the year 1960. Presents monthly and annual means and extremes of the surface water temperatures and salinities for each year of observation after 1954. Earlier observations are combined in 5-year groups. Also includes an index map of Pacific Ocean stations, a list of stations, a table for conversion of Fahrenheit to centigrade, and mean temperature and salinity curves.

ICE MACHINE:

"Ice Maker for Trawlers," by P. F. Konoplev, H. A. Abdul'manov, and V. P. Nekrasov, article, *Rybnoe Khoziaistvo*, vol. 36, January 1960, pp. 66-69, printed in Russian. *Rybnoe Khoziaistvo, VNIIRO Glavniproekt, pri Gosplanie SSSR, Moscow, U.S.S.R.*

INDUSTRIAL MANAGEMENT:

A New Look at Export Markets, by Hani J. Korkegi and Laurence P. Dowd, Management Aid No. 144, 4 pp., processed. *Small Business Administration, Washington 25, D. C., September 1962.* Small businessmen in increasing numbers are taking a new look at export markets. Some of them are seeing tremendous possibilities there. This leaflet is designed to help you re-examine foreign markets. It points out that facts are the key to market research, whether domestic or export. The kinds of facts are much the same for both markets. Although there are some differences in overseas markets, these differences often are not as great as they may seem. Information about specific foreign markets helps owner-managers to work around such differences. This leaflet lists sources, both Government and private, from which small businessmen can get such information.

Renovation-Expansion Checklist, Management Aids

No. 143, 4 pp., processed. *Small Business Administration, Washington 25, D. C., August 1962.* A leaflet designed to help small businessmen who face the problem of renovating or expanding their production facilities. The first section, on weaknesses in present facilities, should help owner-managers determine what sort of renovations are needed. The next section, on what a renovation plan would involve, suggests specific improvements which owners need to consider when drawing up renovation plans. In some cases present facilities may call for an addition to the plant or other expansion.

INSECTICIDES:

"Insecticide Contamination in a Farm Pond. Part I--Origin and Duration. Part II--Biological Effects," by H. Page Nicholson and others, article, *Transactions of the American Fisheries Society*, vol. 91, no. 2, 1962, pp. 213-222, printed. American Fisheries Society, 233 Broadway, New York, N. Y.

IRAN:

Licensing and Exchange Controls--Iran, WTIS Part 2, Operations Report No. 62-42, 4 pp., printed, 10 cents.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., August 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses Iran's import policy, including licensing and exchange controls, commercial profits tax, prohibited imports, and Iran's export controls. Also discusses United States export and import controls and similar information.

IRRADIATION PRESERVATION:

Food Irradiation, vol. 1, no. 2, October-December 1960, 27 pp., illus., processed. Interdepartmental Committee on Radiation Preservation of Food, U. S. Department of Commerce, Washington 25, D. C. Includes, among others, the following articles: "Evaluation of the Wholesomeness of Irradiated Food," by H. F. Kraybill; "Comments on the Wholesomeness of Irradiation-Processed Foods," by B. Connor Johnson; "Package Irradiation Plant in U. K.," by F. J. Ley; and "Information to be Supplied in Support of a Request for Authorisation to Possess Radioactive Substances with a View to the Treatment of Foodstuffs by Ionising Radiations, France."

Food Preservation by Irradiation, 1951-58, CTR-357, 4 pp., processed. Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., May 1959. A bibliography of publications on radiation preservation of foods. Includes an explanation of how to order the reports, addresses of Department of Commerce Field Offices, and types of reports available from them.

"The Radiation Department of the Federal Research Institute for Food Preservation in Karlsruhe (Germany)," by J. Kuprianooff, article, Food Irradiation, vol. 1, no. 4, April-June 1961, pp. 7-8, illus., processed. Interdepartmental Committee on Radiation Preservation of Food, U. S. Department of Commerce, Washington 25, D. C.

ISRAEL:

Fishermen's Bulletin, vol. 4, no. 2 (32), June 1962, 32 pp., illus., printed in Hebrew with English abstracts. Sea Fisheries Research Station, P. O. B. 699, Haifa, Israel. Includes, among others, articles on: "Israel South Red Sea Expedition, 1962," by O. H. Oren; "Fisheries Investigations of the ISRSE (Part I. Thunnids)," by A. Ben-Tuvia; "Transport of Fish from the Red Sea to Eilat," by Z. Samish and A. Har-Tabor; "Hybrids of Two Species of Fishes of the Genus Tilapia (Cichlidae, Teleostei)," by L. Fishelson; "Fisheries in USSR," by S. Tal; and "On the Fisheries of Israel," by M. Shavit.

ITALY:

"Italian Fisheries," by Giuseppe Milone, article, Review of the Economic Conditions in Italy, vol. 16, no. 2, March 1962, pp. 130-145, illus., printed. Banco di Roma, Ufficio Studi, Casella Postale 2442, Rome A/D, Italy. Discusses the role of the fisheries in the Italian economy, necessity for increasing the total productivity of the fisheries, mechanization of the fleet and government regulation of and aid to the fisheries, and size of the fleet and production. Also discusses the excessively large difference between production and consumption prices, the setting up of fishery cooperatives, par-

ticipation of the Italian fishing fleet in the Atlantic Ocean fishery and the necessity of constructing suitable harbors for this purpose, and the necessity for increased fishery production to meet the needs of the expanding world population.

KENYA:

Report on Kenya Fisheries, 1961, 25 pp., printed, 3 s. (about 42 U. S. cents). Government Printer, Nairobi, Kenya, 1962. Reviews the work done by Kenya's Fisheries Department in inland fisheries development, Lake Victoria fisheries, a fish-culture farm, and a trout hatchery and fisheries. Discusses the fishery survey and possibilities of dried fish production at Lake Randolph. The section on sea fisheries discusses landings and value of fishery products, imports, markets, loans to fishermen, crawfish landings, catch of green turtles, and the shark fishery. Also covered are two experimental fishing surveys, oyster culture, use of fish-finding gear, gear research, netting trials, deep-sea snapper traps, drift-shark long lines, and big-game fishing. Included are statistical tables showing landings and value of fish and shellfish.

KING CRAB:

King Crab (PARALITHODES CAMTSCHATICA) Recoveries in 1962 from Alitak Bay Tagging, by Guy C. Powell, Information Leaflet No. 19, 5 pp., illus., processed. Division of Biological Research, Alaska Department of Fish and Game, Juneau, Alaska, September 28, 1962. Of the 5,976 adult male king crabs tagged in August 1961 in Alitak Bay (Alaska), 517 were recovered in July 1962. Tag recovery had been heavy during previous months as well as during July, and as a result, approximately 2,500 crabs (42 percent) had been captured since release.

Length-Width Relationships of Carapace Measurements of the King Crab (PARALITHODES CAMTSCHATICA), by Roy Rickey and William Sheridan, Informational Leaflet No. 2, 6 pp., illus., processed. Division of Biological Research, Alaska Department of Fish and Game, Juneau, Alaska, October 1961. Because taking both carapace length and carapace width measurements of male king crabs requires more time than taking only the length measurement, and because width measurements are subject to greater error, a calculated width was developed and is presented. Data from male king crabs measured in Chiniak Bay, Southeastern Bering Sea, and Kachemak Bay are analyzed and compared. No significant difference was found between slopes of the carapace width-length relationship lines from the three areas. Tests also showed that the length-width relationship for Chiniak Bay data was definitely linear.

LAMPREY:

"Studies on European Lampreys," by Giuseppe S. J. Zanandrea, article, Evolution, vol. 15, no. 4, 1961, pp. 523-534, printed. Society for the Study of Evolution, American Museum of Natural History, New York 24, N. Y.

LANE SNAPPER:

Estudios Estadísticos y Biológicos sobre la Blajaba (LUTIANUS SYNAGRIS) (Statistical and Biological Studies on the Lane Snapper -- Lutjanus synagris), by Zeida Rodriguez Pino, Nota Sobre Investigaciones No. 4, 88 pp., illus., printed in Spanish with French resume. Centro de Investigaciones Pesqueras, Playa Habana, Bauta, Cuba, April 1962.

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LARVAE:

"On the Relation between the Numbers of Eggs, the Larvae of Fishes and the Volume of Plankton Collected Simultaneously with the Larval Net," by Tetsushi Senta, article, *Japanese Journal of Ecology*, vol. 11, no. 6, 1961, pp. 221-223, printed. Ecological Society of Japan, c/o Biological Institute, Tohoku, Japan.

LOBSTERS:

"Lobster Storage Problem Solved," article, *Modern Refrigeration*, vol. 134, February 1962, p. 134, printed. Refrigeration Press Ltd., Maclarens House, 131 Great Suffolk St., London SE1, England.

"Refrigerated Storage of Lobsters," by H. J. Thomas, article, *Scottish Fisheries Bulletin*, no. 17, June 1962, pp. 16-20, illus., printed. Marine Laboratory, Department of Agriculture and Fisheries for Scotland, P. O. Box 101, Victoria Rd., Aberdeen, Scotland.

LOUISIANA:

"Distribution of Fishes in Lake Bistineau, Louisiana," by Victor W. Lambou, article, *Journal of Wildlife Management*, vol. 26, no. 2, 1962, pp. 193-203, printed. Wildlife Society, 2000 P St. NW., Washington, D. C.

NETHERLANDS ANTILLES:

Import Tariff System of the Netherlands Antilles (Aruba, Bonaire, Curacao), WTIS Part 2, Operations Report No. 62-46, 2 pp., printed, 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., August 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses the territory included; currency, weights, and measures; bases of duties; method of payment of duty; sales and other internal taxes; exchange regulations; and trade restrictions. Also discusses the absence of requirements of customs surtaxes, preferential duties, and consular documents and fees.

NETS:

The I. C. E. S. Mesh Gauge, by C. J. W. Westhoff, J. A. Popé, and R. J. H. Beverton, 13 pp., illus., printed. Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund Slot, Denmark, April 1962. The gauge described in this prospectus was developed under the auspices of the Comparative Fishing Committee of the International Council for the Exploration of the Sea. It represents, in the opinion of the Committee, a combination of the best features of the various gauges which have been developed in recent years, and it has been adopted as the standard gauge for research purposes by the Council in place of the 1959 Westhoff Gauge which was previously adopted as an interim standard.

NEW ZEALAND:

Commercial Fishing, vol. 1, no. 1, September 1962, 32 pp., illus., printed, annual subscription rate (12 copies), 36/-; Australia 47/6; U. K. and foreign 38/-; U. S. and Canada \$5.50. (Sole subscription agents: R. Hill & Son Ltd., Cnr. Crowhurst and Kent Sts., Newmarket, Auckland, New Zealand.) *Commercial Fishing*, Trade Publications Ltd., 47

Lewis Eady Bldg., 192 Queen St., Auckland, New Zealand. The first issue of a new periodical devoted to the New Zealand fishing industry. It states that, "In launching the journal, the publishers were influenced by two main considerations: commercial fishing is the only New Zealand primary industry which has not hitherto been served by its own publication; and secondly, all indications are that the industry is approaching a period of all-time record growth." Includes, among others, articles on: "Wholesalers and Fishermen Call for More Dynamic Approach to Industry Development," by A. R. Simm; "Latest Statistics: Last Year's Fish Catch;" "Tuna Project Could be Based on New Zealand and the Cook Islands," by Ronald Powell; "Dunedin Exporter, Back from World Tour, Reports on Overseas Markets;" "Programme for an Integrated Fishing Industry," by W. B. Sutch; "Disputes and Bad Weather Heavily Reduce 1962 Oyster Catch;" "Cutting Cables Can Be Dangerous--and Costly;" "Six Fishing Boats Being Built at Port Chalmers;" "Inflatable Liferafts Have Saved Many Lives;" "Dorman Engines Power Fishing Craft Throughout the World;" "Facilities Being Expanded for Timaru's Growing Fleet;" "San Rosa Makes Experimental Trawl in Bay of Plenty;" "Quest, New Gas-borne Tuna Boat, Will Use Long Line Method of Fishing;" and "New Charts are Important Aids to Navigation."

NIGERIA:

Establishing a Business in the Federation of Nigeria, WTIS Part 1, Economic Report No. 62-57, 8 pp., printed, 15 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., July 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses the Nigerian Government's policy on private foreign investment, incentives to industrial development, foreign ownership, trade factors, and customs tariff. It also discusses types of business organization, industrial property rights, legislation, regulations affecting employment, and taxation.

NORTHERN PIKE:

The Growth and Harvest of Stocked Yearling Northern Pike, ESOX LUCIUS Linnaeus, in a Minnesota Wall-eye Lake, by Merlyn L. Wesloh and Donald E. Olson, Investigational Report 242, 9 pp., printed. Minnesota Department of Conservation, Division of Game and Fish, 301 Centennial Bldg., 658 Cedar St., St. Paul 1, Minn.

NORWAY:

Fiskeflaten 1961 (Fishing Fleet, 1961), Arsberetning vedkommende Norges Fiskerier (1961) No. 13, 30 pp., illus., printed in Norwegian. A.s John Griegs Boktrykkeri, Bergen, Norway, 1962.

Licensing and Exchange Controls--Norway

WTIS Part 2, Operations Report No. 62-41, 4 pp., printed, 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., August 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses Norway's import controls including licensing and exchange controls and export controls including the free list and exchange controls. Also discusses United States controls on exports and imports from Norway and related information.

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"Melding fra Fiskeridirektoren 26/7 1962, Fiskeriverenskomsten mellom Norge og Sovjet-Samveldet" (Announcement of the Fisheries Director, July 26, 1962; Agreement on Fisheries between Norway and the Soviet Union), article, *Fiskets Gang*, vol. 48, no. 30, July 26, 1962, pp. 422-427, printed in Norwegian. *Fiskets Gang*, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

Norges Handel, 1960, *Del II* (Foreign Trade of Norway, 1960, Part II), Norway's Official Statistics, Series 12, no. 73, 259 pp., printed in Norwegian with English titles. Central Bureau of Statistics of Norway, Oslo, Norway, 1962. Discusses foreign trade statistics and the balance of current account, imports and exports of foods included in foreign trade statistics, and index numbers of volume and price. Also covers imports and exports by principal commodities (including fishery products), and foreign trade by countries and by ports of entry. Presents statistical tables showing imports and exports by sections and divisions, by groups and items, and by principal countries and commodities. Commodities are classified according to the Standard International Trade Classification (SITC).

NUTRITION:

"Mathematical Theory of Nutritional Relationship of Fishes," by V. S. Ivlev, article, *Nature*, vol. 192, October 28, 1961, pp. 297-298, printed. *Nature*, St. Martin's Press, 175 5th Ave., New York 10, N. Y.

OCEANOGRAPHY:

Bottom Topography from "Crawford" Cruise Ten Obtained for the International Geophysical Year of 1957-58, by Robert Allen Lubkoff, 8 pp., illus., printed. Oceanographic Institution, Woods Hole, Mass., 1957.

Datos Oceanograficos de la Playa Habana: III (Oceanographic Data for Havana Beach. III), by Jose A. Perez Sori, Contribucion No. 16, 26 pp., illus., printed in Spanish with French resume. Centro de Investigaciones Pesqueras, Playa Habana, Bauta, Cuba, June 1962.

Meeres-Mikrobiologie Tiefseeforschungen (Deep-Sea Microbiology), by A. E. Kriss, 579 pp., illus., printed in German, 98.10 D. M. (about US\$24.53). Gustav Fischer Verlag, Jena, Federal Republic of Germany, 1961. Presents a composite picture of the vertical and horizontal distribution of bacterial populations throughout the world's seas and oceans, including the effects thereon of various seasonal, geographical, and other factors. Includes descriptions of the various species of bacteria, yeasts, and actinomycetes encountered and their morphological variations, both vertical and horizontal. Describes the microbial biomass in the seas and oceans. Covers microorganisms in relation to the biological productivity of the ocean.

Oceanographic Data from "Crawford" Cruise Ten Obtained for the International Geophysical Year of 1957-58, by Frederick Charles Fugister, 129 pp., illus., printed. Oceanographic Institution, Woods Hole, Mass., 1957.

Oceanographic Instrumentation: Salinity, Temperature, and Sound Velocity Measurements, 98 pp.,

printed. Lockheed Aircraft Corporation, Missiles and Space Division, Sunnyvale, Calif., 1960.

The Present Status of Knowledge Concerning the Primary Production of the Ocean, by O. Koblenz-Mishke, Translation 147, 28 pp., printed. (Translated from the Russian, *Okeanologiya*, vol. 1, no. 1, pp. 95-106.) U. S. Hydrographic Office, Washington, D. C., 1962.

Processing Physical and Chemical Data from Oceanographic Stations, Manual Series Publication M-2, 110 pp., illus., processed, 90 cents. National Oceanographic Data Center, Washington, D. C., 1962. (For sale by U. S. Navy Hydrographic Office, Washington 25, D. C.) The National Oceanographic Data Center is sponsored by 6 government agencies having an interest in the marine environment. The sponsoring agencies are Atomic Energy Commission, Bureau of Commercial Fisheries, Coast and Geodetic Survey, Department of the Navy, National Science Foundation, and Weather Bureau. This publication describes the methods used at the National Oceanographic Center (NODC) for reducing processed physical and chemical oceanographic station data to a standard format. It is intended also for use by other agencies or contributors interested in furnishing oceanographic data to NODC or making their data systems compatible with those of NODC. An outline of the format of the Computed Card is included in order to acquaint the users of the NODC oceanographic station data holdings with the end product of the routinely performed computations.

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Studies on the Characteristic Odor of Squid. VI--Liquid Acids in the Unpleasant Odorous Isolate from Rain Spoil Dried Squid, by Tei Yamanishi, Toshio Kiribuchi, and Michiko Ishiwata, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 27, November 1961, pp. 1009-1013, printed. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

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"Ghana Stern Trawlers Completed," article, World Fishing, vol. 11, no. 9, September 1962, pp. 24-26, illus., printed, single copy 3s. (42 U. S. cents). John Trundell and Partners, Ltd., St. Richard's House, Eversholt St., London NW1, England. Describes two new freezer stern trawlers (the Odaw and Kakum) recently built in the United Kingdom for Ghana. The trawl is handled on the main deck and a conventional ramp is not necessary, since a Unigan gantry is used. Features include a hydraulic trawl winch, hydraulic anchor windlass, hydraulic steering gear, two large blast freezers with a capacity of 15 tons of fish every 24 hours, and the most modern fish-finding and communications equipment.

"Junella--Britain's Second Freezer Stern Trawler," article, World Fishing, vol. 11, no. 9, September

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1962, pp. 30-34, illus., printed, single copy 3s. (42 U. S. cents). John Trundell and Partners, Ltd., St. Richard's House, Eversholt St., London NW1, England. Describes a newly-commissioned freezer stern trawler having a modified bulbous bow, a forward section strengthened for ice, a system of gear-hauling which involves use of a fixed bipod gantry aft of the superstructure, and a freezing capacity of 400 kits (56,000 pounds) of heads-on gutted fish every 24 hours. The fish pounds are situated below the trawl deck immediately forward of the hydraulically-operated hatch through which the cod end is emptied. After gutting, fish are placed in a circular washer, passing then by conveyor to the factory deck and the 11 12-station vertical plate freezers. The frozen blocks of fish are discharged from a hatch in the trawl deck. The blocks are hauled on deck by pulley and rope using specially-shaped baskets, then placed on a conveyor transporting them on to the fish dock. Power is supplied by 3 Diesel engines, giving a total of 2,715 hp. Gear includes two echo-sounders, electronic communication and navigation equipment.

"A Soviet-Built Stern Trawler, article, *Motor Ship*, vol. 42, no. 494, 1961, pp. 268-270, illus., printed. *Motor Ship*, Temple Press Ltd., Bowling Green Lane, London EC4, England.

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Licensing and Exchange Controls--Switzerland and Liechtenstein, WTIS Part 2, Operations Report No. 62-40, 4 pp., printed, 10 cents. Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., August 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses Swiss import controls, including licensing and exchange controls; Swiss export controls, including licensing; and Swiss exchange controls. Also covers United States export and import controls, and other similar information. Swiss regulations affecting

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Fisheries of Taiwan, 17 pp., illus., printed. Chinese-American Joint Commission on Rural Construction, Taipei, Taiwan, June 1962. Provides a rather compact review of the fisheries in Taiwan. The report discusses the deep-sea fisheries, and points to tuna long-lining as the most promising fishery for Taiwan. Inshore and coastal fisheries, fish culture, fish processing, and marketing are also reviewed.

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General Agreement on Tariffs and Trade, Analysis of United States Negotiations. Volume III, 152 pp., illus., printed, 45 cents. Department of State, Washington, D. C., 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) The United States has completed its negotiations in the bilateral phase of the 1960-61 Tariff Conference held under the auspices of the Contracting Parties to the General Agreement on Tariffs and Trade (GATT), in Geneva, Switzerland. This part of the analysis covers the results of the reciprocal negotiations with Cambodia, Haiti, India, and Japan. Also included in this volume is a consolidated list of all the concessions granted by the United States to all countries which negotiated new concessions with the United States as a result of the tariff conference, and a summary of the concessions granted by the United States, including comments on some of the most important concessions negotiated.

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WEATHER CHARTS:

The following processed weather charts, 2 pp. each, are published by the Weather Bureau, U. S. Department

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of Commerce, Washington, D. C., and are for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., 10 cents each. Charts show stations displaying small craft, gale, whole gale, and hurricane warnings, explanation of warning displays, and schedules of AM and FM radio, TV, and radiophone stations that broadcast weather forecasts and warnings.

Coastal Warning Facilities Chart, Canadian Border to Eureka, Calif., and Alaska, 1962.

Coastal Warning Facilities Chart, Eastern Fla., 1962.

Coastal Warning Facilities Chart, Eastport, Maine, to Montauk Point, N. Y., 1962.

Coastal Warning Facilities Chart, Manasquan, N. J., to Cape Hatteras, N. C., and Chesapeake Bay, 1962.

Coastal Warning Facilities Chart, Morgan City, La., to Apalachicola, Fla., 1962.

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"The World Catch 1961," article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 51, no. 8, August 1962, pp. 312-314, 316-318, 321-328, illus., printed in Norwegian and English. Hvalfangstforeningen, Sandefjord, Norway. The International Whaling Commission held its 14th meeting in London, July 2-6, 1962. For this meeting, the Bureau of International Whaling Statistics had prepared a provisional issue of International Whaling Statistics No. XLIX comprising the world catch in 1961. By the world catch in 1961 is meant the catch in the Antarctic in the season 1960/61 and in the fields outside the Antarctic in the calendar year 1961. Discusses whaling operations in the North Atlantic and Arctic, Africa, the North Pacific, Japan, Bering Sea, Kamchatka, Kurile Islands, Brazil, Peru, Chile, Australia, and New Zealand. Also discusses the production of whale byproducts. Includes statistical tables showing whaling results by the various countries and areas and the production of byproducts by years and areas.

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CERTAIN CANNED FISHERY PRODUCTS REQUIRE LONGER HEAT PROCESSING

"It has long been known that starchy foods have a very slow rate of heat penetration. Fishery products such as fishballs, fish pudding, and fish pastes must be processed for longer periods than fish which are canned without added starchy ingredients. For example, fish pudding will require a process averaging 5 minutes longer than mackerel or salmon solely because of starch content, even though the size of can, fill, initial temperature, and all other factors show no difference between the products.

A product packed too tightly heats much more slowly than a more loosely-packed can of the same product. This is indicated most clearly in the canning of certain vegetables, but the condition may occur in the canning of fishery products. A too heavy consistency will of itself delay the rate of heat penetration."

--"Principles and Methods in the Canning of Fishery Products," Research Report No. 7 (page 21), U. S. Fish and Wildlife Service.

*Season's
Greetings*

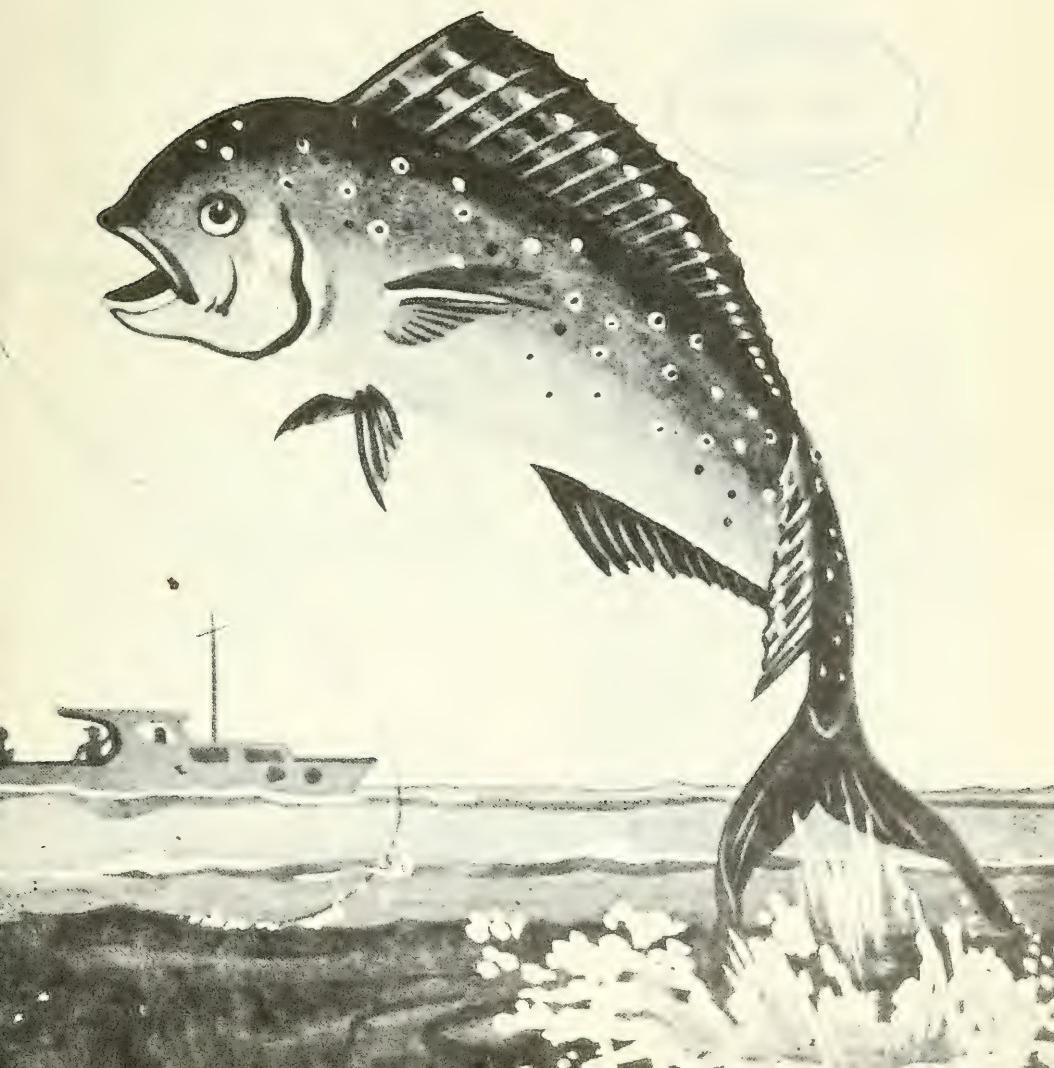


COMMERCIAL FISHERIES Review

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Fishes

Index for 1962

.Volume 24 .



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An index of Volume 24, Numbers 1 through 12, issued in 1962. It is a subject index, with an author index for only the feature articles in each monthly issue. Indexing of other material is based on the principal subject with some cross-reference. The use of " " in entries denotes the omission (repetition) of the major subject heading which appears in ALL CAPS.

Actions in Congress affecting or of interest to commercial fisheries are indexed only once by subject under the general heading: "CONGRESS, EIGHTY-SEVENTH (Second Session)", i.e., there is no cross-reference indexing of these entries.

Publications listed in the "Recent Fishery Publications" section have not been indexed.

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Use of funds for printing this publication was approved by the Director, Bureau of the Budget, April 18, 1968.

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**SKEWERED SCALLOPS**

1 pound scallops, fresh or frozen
 1 pint cherry tomatoes
 2 large green peppers
 $\frac{1}{3}$ cup lemon juice

3 tablespoons honey
 3 tablespoons prepared mustard
 2 tablespoons melted fat or oil
 $1\frac{1}{2}$ teaspoons curry powder

Thaw frozen scallops. Rinse with cold water to remove any shell particles. Cut large scallops in half. Wash tomatoes and green peppers. Cut green peppers into 1-inch squares. Alternate scallops, tomatoes, and green pepper on 40 skewers or round toothpicks approximately 3 inches long. Place kabobs on a well-greased broiler pan. Combine remaining ingredients. Brush kabobs with sauce. Broil about 4 inches from source of heat for 5 to 7 minutes. Turn carefully and brush with sauce. Broil 5 to 7 minutes longer, basting once. Makes approximately 40 hors d'oeuvres.

This idea for entertaining is from a 22-page, full-color booklet, "Nautical Notions for Nibbling," released by the United States Department of the Interior's BCF. It is available for 45¢ from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402. Ask for Market Development Series No. 10, (catalog no. I-49.49/2:10).

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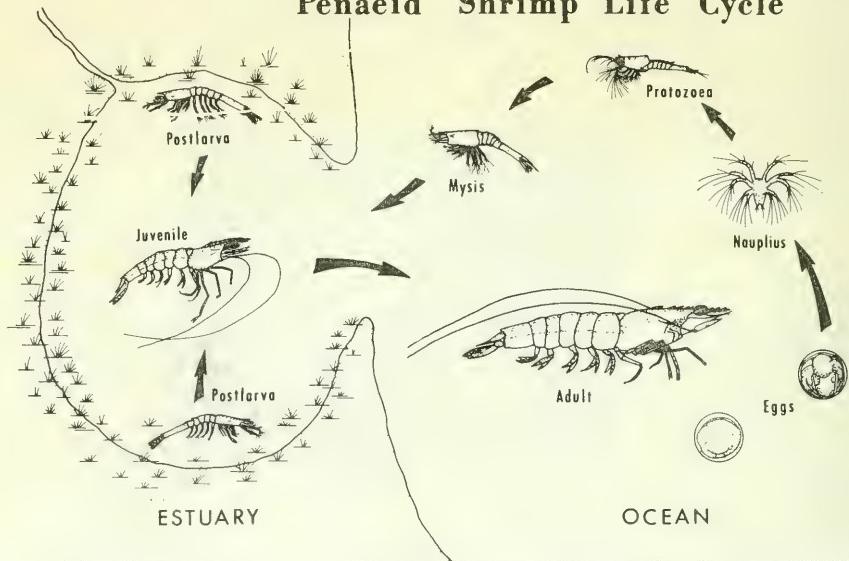
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